New Zealand JOURNAL of AGRICULTURE

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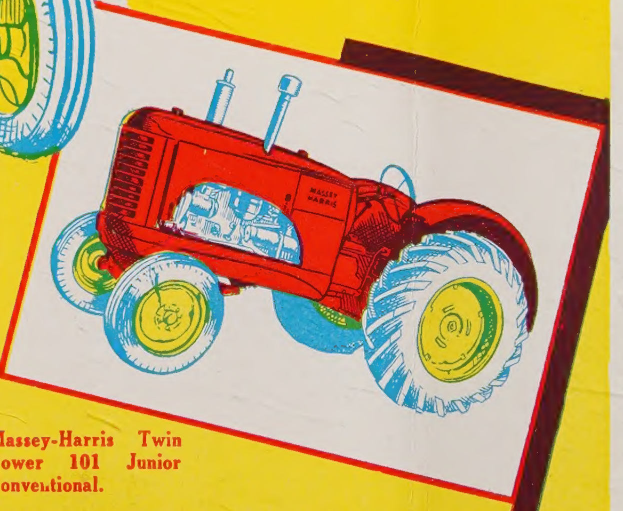

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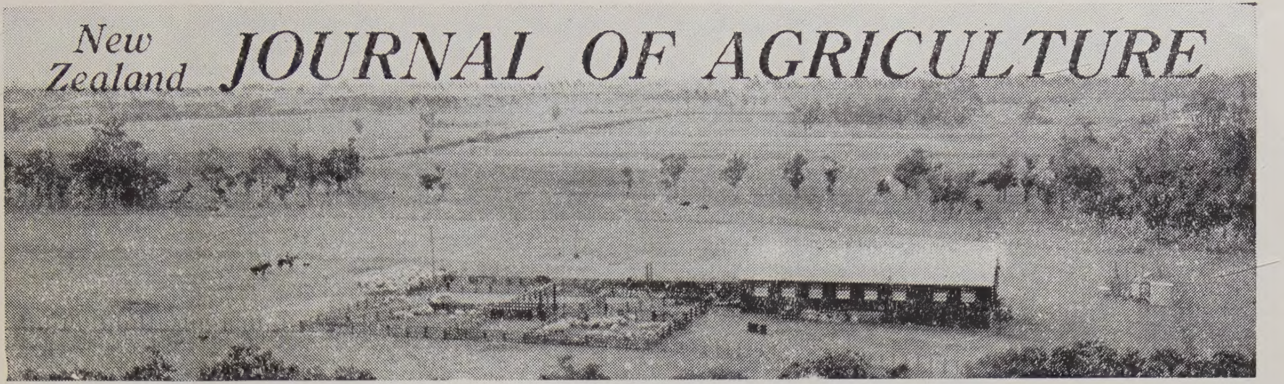

Vol. 72, No. 2. Published by Direction of Hon. B. Roberts, Minister of Agriculture. February 15, 1946.

Food and Agriculture Organisation of United Nations

THE Food and Agriculture Organisation of the United Nations was established at Quebec when the constitution was signed by representatives of participating nations on October 16, 1945. This action consummated the work of the 1943 Hot Springs Conference—the first fully-representative conference of the United Nations—and what is now known as FAO becomes the first constituted United Nations organisation.

It is confidently expected that the decisions made at the London Conference of the United Nations Assembly will enable FAO to take its place as an integral part of the world economic and social structure designed to promote peace and prosperity among the peoples of the world. As a section of United Nations Organisation, backed by the good will of the peoples of member nations, it will contribute to a wider understanding of the role of food in world affairs, and will provide the focal point through which world co-operation can replace world chaos in matters pertaining to nutrition and production and distribution of food.

It should be clearly understood that FAO in itself has no controlling or directive powers; it will act in an investigatory and advisory capacity only. Its headquarters will, it is expected, be with the economic and social sections of the United Nations Organisation, and its administration will act in an advisory capacity to that organisation. Its immediate direction is in the hands of a Director-General—Sir John Boyd Orr—and an Executive Committee of 15 members. It is expected that a Deputy Director-General and Divisional Directors will later be appointed, and the Executive Committee is to meet in March to finalise the administrative machinery and programme of work.

Mr. E. J. Fawcett, Director-General of Agriculture, New Zealand's representative on the Executive Committee of FAO.

A commencement has already been made in the compilation of a world food picture and an assessment of potential production is in hand. A detailed study of nutritional standards will be made in order that a balance sheet of supply and demand may be prepared. It will be necessary to build up a statistical service as a background to future work, and negotiations are proceeding to incorporate the Institute of Agriculture at Rome in the FAO structure.

It is envisaged that the organisation will act as a clearing house for all matters pertaining to scientific development in agriculture and food processing and distribution, and will take a prominent part in the proper handling of surpluses to ensure that they are distributed to areas requiring them without disastrous price fluctuations to producers. The FAO will be particularly concerned with the development of agricultural organisation and food production in those countries unable to provide sufficient food from their own resources to ensure a reasonable standard of nutrition for their people.

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The organisation will be responsible on request—or of its own volition—for the preparation of blueprints covering all phases of agricultural development for the guidance of the Governments of such countries. It is envisaged that these reports will provide the basis of recommendations for provision of capital from the countries' own resources or from the International Bank.

The technical personnel required for such duties will, it is hoped, be recruited from the existing staffs of member nations on a secondment basis in order that costs may be held at the minimum level. As the organisation becomes established it is expected that regional offices will be required, probably in Europe and Asia and finally in South America. Fish and forest products have been added to the list of subjects coming within the purview of the FAO, and already surveys of resources and potential production of these two industries are being undertaken.

New Zealand already enjoys perhaps the highest average standard of living of any member nation, and thus our role in the field of food production will be mainly the provision of our surpluses to other less fortunate countries.

From the marketing and distribution viewpoints, membership of the FAO has for us a special significance, for it must be our sheet anchor in providing continuity of absorption of our increasing production at prices which will be satisfactory to producers. It offers in the ultimate perhaps our best guarantee of expanding overseas trade, which is so essential to the economic stability of the Dominion.

The Executive Committee of 15 members is formed on a widely-spread geographical basis, and consists of persons qualified technically and administratively to guide the organisation through its formative stages and to ensure its operation in the best interests of all peoples to whom adequate food and shelter is essential if world peace is to be maintained.

The personnel of the Executive Committee is as follows:—

Prof. Andre Mayer, Chairman—Vice-president, College de France.

Howard R. Tolley, Vice-chairman—Chief, Bureau of Agricultural Economics, U.S. Department of Agriculture.

Sir Girja Shankar Bajpai—Agent General for India in the United States of America.

Edouard Baker—Chief, Control of Agricultural and Industrial Enterprises, Department of Agriculture, Haiti.

G. S. H. Barton—Deputy Minister of Agriculture, Canada.

Newton de Castro Belleza—Superintendent of Agriculture and Veterinary Education and Director of National Defence Section, Ministry of Agriculture, Brazil.

R. R. Enfield—Principal Assistant Secretary, Economics Division, Ministry of Agriculture and Fisheries, United Kingdom.

E. J. Fawcett—Director-General of Agriculture, New Zealand.

Anders Fjelstad—Delegate of the Royal Norwegian Government on Agricultural Affairs in the United States of America.

Alfonso Gonzalez Gallardo—Under-Secretary of Agriculture, Mexico.

Darwish Haidari—Director, Central Agricultural Experiment Station, Irak.

Stanislaw Mikolajczyk—Deputy Prime Minister and Minister of Agriculture and Agricultural Reform, Poland.

P. W. Tsou—President, Agricultural Association of China; Senior Adviser to the Ministries of Agriculture and Forestry and of Food; Resident Representative in the United States of America of the Ministry of Agriculture and Forestry.

P. R. Viljoen—High Commissioner for the Union of South Africa in Canada.

Arthur Wauters—Minister Plenipotentiary, Minister of Foreign Affairs, Belgium; Chairman, Belgian Food and Nutrition Commission.

Pasture Improvement

New Zealand, particularly the North Island, has some of the finest pastures in the world. Despite what has been claimed for the benefits of fertilisers and lime these pastures are stock made, and are dependent for their existence on grazing. Without stocking, grasslands would ultimately revert largely to scrub and forest. Grazing management can be the most potent factor for better or for worse in pasture transitions.

Much of the renewable grassland on ploughable country has been down too long, having degenerated into weak, weed-infested, low-producing swards likely to be difficult or very slow to bring back by grazing management alone. Large areas of existing grasslands under extensive grazing management are, in reality, only long-rotation pastures, and cannot be farmed efficiently when treated as truly permanent swards. More breaking up of such pastures should be undertaken in preparation for autumn sowings of new pasture, especially where the land is unsuitable for cropping.

Improvement in grassland depends on producing the feed to build up the pastures through the stock. Especially on light and medium grasslands, clover, stimulated by topdressing, is the key to initial feed production and vigour of pasture. Subsequent management, following principles of controlled grazing, ensure better utilisation of feed, more even dung distribution and hoof cultivation, leading to general pasture improvement and increased carrying capacity. Overstocking and underfeeding or continual set stocking tend to general pasture deterioration.

High carrying capacity with high production per acre has a greater element of risk than lenient grazing systems, unless feed reserves are available for emergencies as well as for seasonal periods of feed shortages. The building up of pastures and efficient pasture utilisation without penalising the producing stock is the real test of grassland farming efficiency.

—*E. M. BATES, Instructor in Agriculture, Alexandra.*

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MILLET . . .

ALTHOUGH the growing of millet has a minor place in New Zealand farming practice, it is easily grown, is relatively cheap, and grows rapidly even in dry weather, advantages which recommend it as a catch crop to provide fodder when other feed is short, or for the making of hay or silage. Cropping practices with millet in the north, its advantages and disadvantages, and utilisation of the crop are discussed in this article by P. S. Syme, Instructor in Agriculture, Warkworth.

JUDGING by the area grown each year, millet may be regarded as one of the minor crops in the farming economy of New Zealand. In 1938-39 the total area grown amounted to 1,538 acres, this figure being reduced to only 728 acres in the 1942-43 season. Normally, about 11 per cent. of the crop is grown in the North Auckland land district, 40 per cent. in the Auckland land district, 30 per cent. in the Wellington, and 10 per cent. in the Hawke's Bay land districts.

Regarded from the viewpoint of the weight per acre or the nutritive value, the yield of millet is not impressive, and its true significance lies in the ease with which it can be grown, its relative cheapness, and its rapid rate of growth. These attributes, combined with its ability to make growth even in a dry period, have led to its use as a summer catch crop to provide fodder at a season when other feed is often in short supply.

Japanese millet heads showing the prolific amount of seed produced. Owing to the low price of seed and the relatively small amount required per acre, millet is a cheap crop to grow.

Place in Rotation

In general practice millet is looked on mainly as a catch crop which can be used to turn to some useful account land which would otherwise be idle during the summer months. In the north it is perhaps most commonly grown after a crop such as swedes where it is intended to sow the land in permanent pasture in the following autumn. Being a quick grower, it can conveniently be grown and then fed off in time to permit of the preparation of the ground for grassing in late February or March. Since only a light seeding is required and the price of the seed is only about 3d. a pound, the out-of-pocket cost amounts to only a few shillings an acre, so that even if the crop should not provide a great deal of feed, it can also be said that it costs very little to try it. The fact that even a small amount of fresh greenfeed may have a disproportionate value in a dry season may also be a factor worth taking into account.

Varieties

The variety almost invariably grown in New Zealand is the Japanese millet. It is an upright grower which stools fairly well and comes away quickly again after being fed off. The variety known as French millet is more succulent and has a slightly higher nutritive value than the Japanese millet, but it does not stool out so well and is less resistant to dry conditions.

Preparation of Seed-bed

While millet yields heavier crops on the richer soils, it is by no means fastidious, and, with adequate fertiliser, good crops have been grown on a wide variety of soil types ranging from sandy loams to clay loams, but it does not thrive where the land is wet or drainage is bad. Like most crops with a relatively small seed, it succeeds best on a well-worked and properly-consolidated seed-bed. Since it is sown at a warm period of the year and germinates quickly, there is not the same risk of the soil caking and retarding germination as sometimes happens when small seeds are sown on a too finely prepared seed-bed in the autumn, and it is desirable that the ground should have been well cultivated.

There is frequently another reason, however, why the ground should have been thoroughly worked before sowing. Millet is largely a surface feeder, and forms a thick mass of fibrous roots which is apt to make normal methods of cultivation difficult for the following crop. This means that where permanent pasture is to follow the millet the farmer should cultivate the ground with a thoroughness commensurate with the requirements of the grass crop **before the millet is sown.** The interval between the feeding off of the millet and the sowing of the autumn pasture allows of little time for the fibrous mat of millet roots to rot down and be incorporated with the soil, so that ploughing as a rule is not a very good policy and makes it difficult to prepare the well-worked and consolidated type of seed-bed so desirable for the establishment of the white clover in a young pasture.

Time of Sowing

Millet is primarily a crop of warm climates and grows at its best in the hot summer months. It does not like cold weather and cannot withstand even light frosts. On this account the crop should not be sown until the danger of a late frost is past, and, on the other hand, sowing should not be

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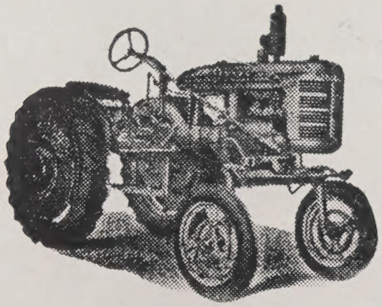

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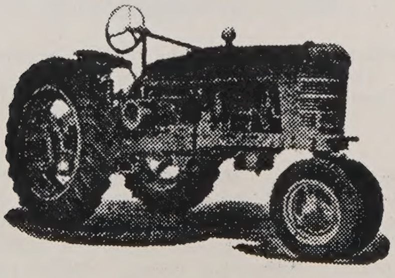

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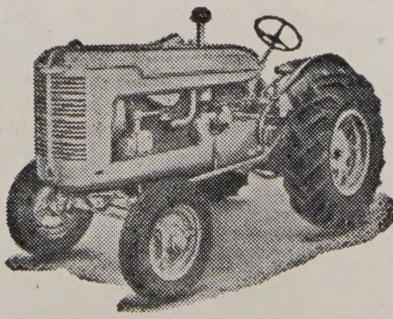

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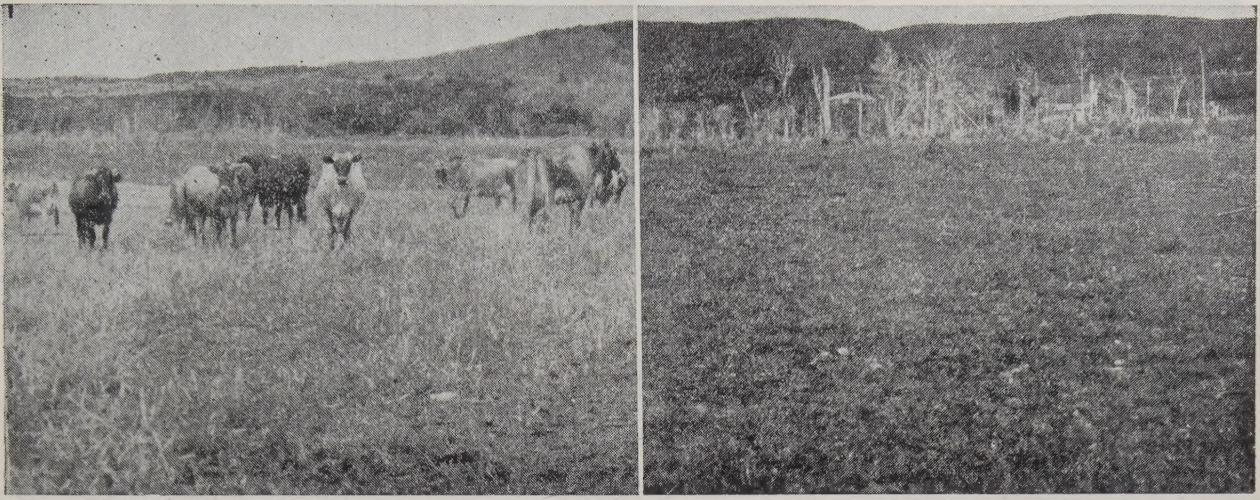

Left—A millet crop being grazed off by cows to supplement the pasture growth in a dry period. Right—A few months later—the same field now in permanent pasture.

so late as to run the risk of damage from an early frost before the crop has been used up. In practice the deciding factors are usually the time at which the feed is likely to be needed and the time by which the land must be cleared to allow of preparation for the following crop. Under normal conditions millet is ready to feed off in about 8 to 10 weeks from the date of sowing, so that fields sown from the end of October into December can be ready for feeding off in January and February, leaving time for preparing the ground for an autumn sowing of grass. Although later sowings are common, these are liable to involve delay in getting in the autumn-sown grass seed, so that the prospects of the young pasture may be greatly prejudiced by the advent of the cold weather.

The seed may be drilled in 7in. rows at about 10 to 15lb. per acre, or broadcast at about 15 to 20lb. per acre. Although a lighter seeding may prove quite satisfactory where conditions are favourable, it is generally a mistake to sow too thinly. Besides giving a heavier yield, a good dense crop has a better smothering effect on weed growth, and this is frequently a matter of importance, particularly where the following crop is to be sown with only surface cultivation sufficient to provide a seed-bed. Broadcast seed may be covered by a light harrowing after sowing.

Although millet is normally grown purely as a catch crop, grass seed is sometimes sown with it. Being a very quick grower, there is a danger that the millet will smother the slower-growing species and cause a very poor establishment. So long as the sowing is not too heavy, however, it may possibly be worth while including a few pounds of paspalum seed when the millet is to be followed by permanent pasture. If the paspalum fails, the loss is small, while, if it should succeed, the pasture may contain as much paspalum by the second year as

Left—If grazing is left too late, millet soon runs to seed. Photo shows a crop of millet growing from seed shed the previous season. The field was worked up and sown in swedes in the following year, and the millet came up again along with the swede crop. Right—A dense crop of self-sown millet growing alongside an area in mangolds. Photo shows the height of the crop when full grown.

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is normally present in about six years when the paspalum is autumn sown along with the grass seeds mixture in the ordinary way.

Manuring

Although millet responds well to fertilisers, it is generally regarded as a cheap, short-lived catch crop which does not warrant a heavy application of manure. Where the crop is to be followed in a few months' time by a sowing of grass seeds, however, there is no doubt that a considerable residue of the fertiliser applied at the time of sowing will still be available, so that an application of 2 to 3cwt. of a quick-acting phosphate may be profitable. Due regard should also be paid to adequate liming in the event of any lime deficiency. Since the crop is usually fed off, much of the manurial value is returned directly to the soil to the benefit of the following crop. Although the yield may be increased by the use of a nitrogenous fertiliser such as sulphate of ammonia, it is very doubtful whether any increase so obtained is likely to be justified by the cost involved. Millet has a reputation of being an exhausting crop. While it does not make particularly heavy demands on the soil, it is shallow rooted and so extracts most of its nutriment from the top few inches of the soil, and this frequently has a detrimental effect on the quick establishment of the following crop, particularly where the fertility is somewhat low.

Utilisation

Unlike the sorghums, millet is not poisonous at any period of growth. However, if fed too late when the seed heads are ripening, it may contain a high proportion of indigestible fibre, and fatalities may result from impaction of the rumen. A common practice is to feed the crop off in breaks. Feeding off usually commences when the crop is about 10in. high, and as each break is eaten down it should be closed to permit of regrowth. If conditions are favourable, the crop should again be fit for grazing in about 3 to 4 weeks' time. The crop can be fed off when quite young without danger to stock, though it is liable to cause some scouring if used too soon. It is equally suitable for cows or sheep, and, when used with discretion, can safely be fed to young stock.

Millet can also be used for the making of hay or silage. When grown for this purpose it should be sown fairly thickly, and should be cut as soon as the blossoms appear. Cutting too late results in a less-digestible fodder, and it is safer to cut too soon rather than too late. As the green crop contains a high percentage of moisture, special care is needed when it is being made into

A good crop of millet ready for feeding off.

hay, and it is usual to put the material into small cocks to cure before it is finally stacked.

Feeding Value

Considering the ease with which it can be grown, its rapidity of growth, and its ability to withstand dry conditions, millet would at first sight appear to be almost the ideal summer catch crop. Judging by the relatively small acreage grown, however, it is obvious that practical experience does not confirm its claims to special merit. In comparison with mixed pasture or green oat fodder it has a low protein content and a wide nutritive ratio :—

Digestible Nutrients.

	Dry Matter.	Crude Protein.	Carbo-hydrate.	Fat.	Nutritive Ratio.
Millet	21.3%	1.0%	12.1%	0.6%	1 : 13
Mixed pasture ..	29.7%	3.6%	14.5%	0.9%	1 : 4.6
Green oat fodder ..	26.1%	2.3%	11.8%	0.8%	1 : 5.9

The relatively low value shown by analysis seems to be confirmed by the experience of those farmers who claim that it is much inferior to grass or turnips as a milk-producing food. Because of its low protein content it can advantageously be fed where access is provided to some good clovery pasture.

Yield of Crop

Although capable of giving yields of over 3 tons of cured hay per acre where management, climatic conditions, and soil are all favourable, the conditions under which millet is usually grown are not conducive to heavy crops, and, in actual practice, yields of about 1½ to 2 tons of hay taken at the haying stage, or a total of about 12 tons of greenfeed, could be considered good. Where grown for seed the yield averages from 20 to 35 bushels per acre, a bushel weighing from 45 to 50lb.

Reference has already been made to the objection to ploughing after millet on account of the shallow, fibrous root system. If time is short, this may make proper cultivation for the subsequent crop anything but easy, and when autumn-sown grass is to follow millet it is a common practice to graze down close with sheep and then rely on careful light discing or the use of a light harrow to produce a seed-bed. This avoids bringing up the roots, and is also preferable to ploughing, which is liable to produce a loose, springy, unconsolidated surface unsuitable for the sowing of a grass seeds mixture.

Admittedly, a crop of millet can be of real value in a dry summer, particularly where good paspalum is not available. Where millet is to be grown as a catch crop before an autumn sowing of grass, however, its obvious limitations should be kept in mind so that its growth may not prejudice the establishment of the more important permanent pasture, either by removing plant nutriment, preventing adequate cultivation of the ground, or unduly delaying the sowing of the grass seed till too late in the autumn.

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Book Review

"The Potato in Health and Disease": T. Whitehead, T. P. McIntosh, and W. M. Findlay.

"THERE is no agricultural crop plant which possesses so wide an appeal as the potato. Interest in the crop ranges from specialist growers to any man who has a few yards of land to cultivate in his spare time."

As with the plant itself, so also with any book written about the plant, and most potato growers will find something of interest and value in the latest publication, "The Potato in Health and Disease."

The Scottish authorities Dr. T. Whitehead, Dr. T. P. McIntosh, and Mr. W. M. Findlay have assembled facts about the potato plant from the publications of many countries. These, together with their own knowledge of the plant, are presented in the 400 pages of this book in a most readable form.

Production of potatoes in New Zealand, measured by that in many other countries, is limited. This, combined with the fact that a portion of the book has specific reference to British-grown varieties, may limit the usefulness of this book here.

Nevertheless, to the student the work should prove a valuable text-book, containing as it does references to and information from very many scientific articles of world-wide interest. To the commercial grower and, particularly, the seed-raiser there are few pages which do not carry information of value about potato-growing activities. To the home gardener who, not content with information gained "over the fence," wishes to study his potato patch scientifically the book should provide reading matter for many evenings.

The new work is divided into three main sections—varieties and intervarietal differences, the growing of the crop (including maintenance of seed stocks), and the chief diseases of the potato.

Of particular interest is the inclusion of a four-page "Key to Diseases, Pests, etc.," which, while not claimed by the authors as infallible, at least gives a useful guide to a range of diseases and conditions wider than normally experienced in this country.

In all, the authors have achieved their aim of assembling in one book knowledge which until now has been scattered through many inaccessible scientific journals.—J.H.C.

"The Potato in Health and Disease": T. Whitehead, T. P. McIntosh, and W. M. Findlay. Published by Oliver and Boyd Ltd., Edinburgh. 25/- net.

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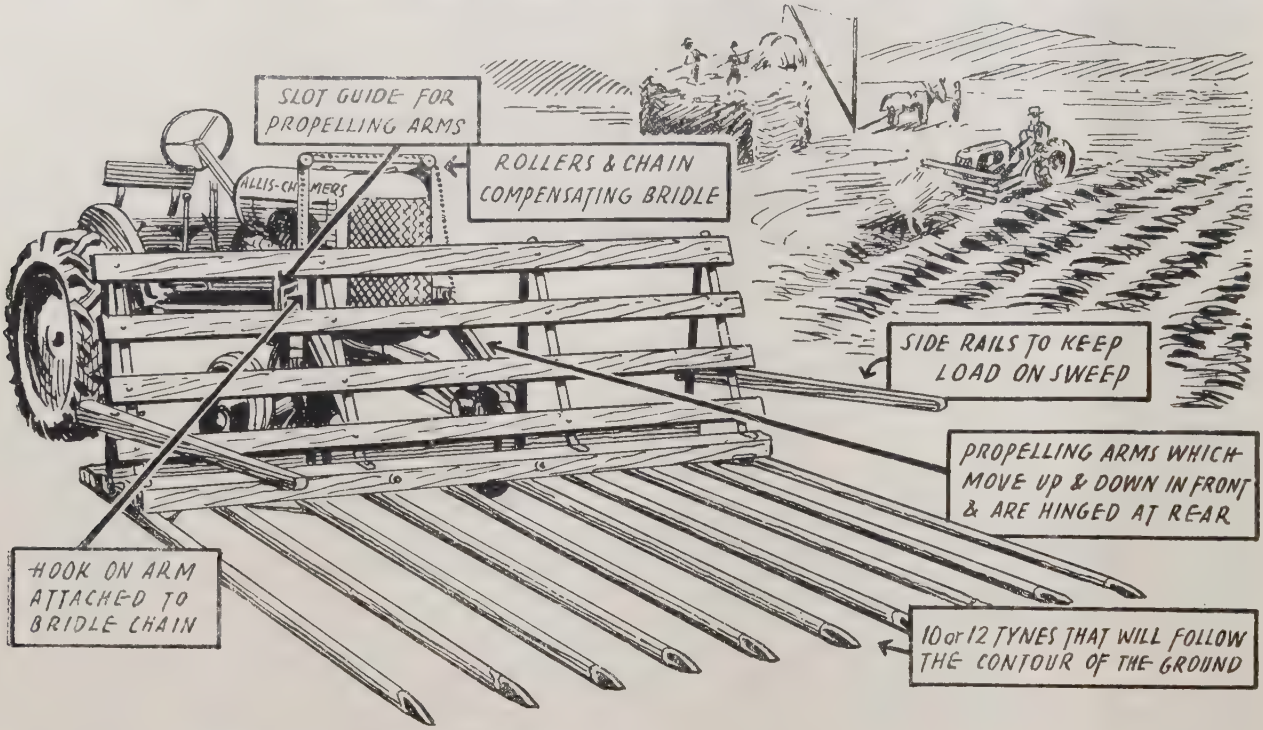
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HAYMAKING EQUIPMENT

HAYMAKING equipment must function smoothly and efficiently. Attention to points emphasised by T. E. Rodda, Fields Instructor, Hamilton, in this article on the operation and care of some of the principal machines used for the making of hay and silage will ensure maximum efficiency throughout that peak period of the use of such implements, when breakdowns and delays caused by neglect are so expensive in time and labour.

The Mowing Machine

The mowing machine is one of the most important field machines used by the dairy farmer and the man who annually makes a fair amount of hay and silage. It requires more attention than the average man is inclined to give to keep it in good and efficient running order; nevertheless good attention and proper upkeep pay good dividends. Usually a booklet of instructions issued by the makers accompanies each new machine. If such booklet or operating manual has been lost or cannot be found, the following brief maintenance instructions will prove of value.

If the machine has been in use for some time and shows a tendency to jam frequently and be a very heavy load for the horses, it is desirable to check up to ascertain if everything is in correct position and functioning correctly. The first essential is to see that the cutter bar is in correct alignment. First of all place the machine on a level concrete or wooden floor and prop up the pole so that it is raised to the correct working height, which should be from 30 to 32in. at the cross-bar end. Next tie a stout string to one of the spokes of the left hand wheel, bring it across the faces of both wheels, and tie securely to a weight that will keep the string in true line with the faces of the wheels. Pull the end of the cutter bar back as far as the wear will permit, and measure the distance from the cord to the back of the knife at both ends. If in correct alignment, the following should be the differences in measurement at the head of the knife and near the grass divider shoe at the end: 5ft. bar, 1½in.; 6ft. bar, 1¾in.; 7ft. bar, 2in. If these measurements do not in any way correspond with those on the machine under test, and it is found the end of the knife bar is sagging backwards, an adjustment can be made by following the instructions given in the manufacturers' manual for any special make of machine. In the case of the machine illustrated the adjustment can be made by shortening the fender bar at the point marked A under the guard as illustrated in Fig. 1.

Another method of taking these measurements is to tie a piece of stout string to the guard of the crank wheel, to which is attached the pitman that drives the knife (see Fig. 1). Draw the string through the opening in the main shoe at the head of the knife, and across to the grass divider shoe at point 2, as shown in Fig. 2. Draw string tight, making sure that it is square across and just touching the face of the crank wheel at point 1 (Fig. 2). If the alignment is correct, the differences in measurements from string to the back of the knife should be the same as in the previous method. If they do not correspond, adjustments will have to be made accordingly.

The knife should always be functioning truly in the cutter bar; the length of the stroke both in and out should be the same. To test this place the machine out of gear and pull the pitman to its furthest point on the outward stroke, and observe if the points of the knife sections pause in the centres of the fingers. Now turn the pitman back until it comes to the end of the inward stroke, and note if the points are again in the centres of the fingers. If the knife section points centre at both ends of the stroke, the adjustment is correct, but if not, the pitman is either too long or too short. Variation in length of pitman is often the result of a broken one being replaced by one not exactly correct. A mistake may have been made in ordering or supplying a pitman from another slightly different pattern of machine made by the same manufacturers. Whatever the cause, every endeavour should be made to adjust the length to ensure that the stroke is correct. Some makes of machines have the pitman threaded at one end to enable it to be readily altered in length.

In ordering new parts be careful to quote the serial number of your machine, and be most careful to give the correct number of the part according to the parts list. A little time may well be spent in studying the parts list, comparing with the part or parts required, and making absolutely sure you have the correct number written on your order.

To make sure that the knife is at all times cutting correctly frequent inspections must be made to see that the knife sections are sliding correctly and evenly on the ledger plates. Provision has been made by the manufacturers to keep the knife sections in correct position by attaching holders at intervals along the length of the cutter bar. If the knife sections are inclined to rise off the ledger plates, the holders should be tapped

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down with a hammer to make them just touch and no more, so as to keep all sections flat on the ledger plates without putting undue pressure on the knife at any one point. A certain amount of wear takes place on the points of the holders, and frequent attention must be given to see that the pressure is even at all points. When the holders become too worn or thin on the points do not delay in replacing them. Ledger plates when new have serrated edges. When these edges become worn and smooth they should be replaced. Right and wrong settings are clearly shown in Fig. 3.

Gears:

All gears should be examined at the end of each cutting season to ascertain if there is any undue play or slackness in any part. Instructions usually given in the manufacturers' manual about adjustments necessary to take up wear should be read carefully. If you do not possess the necessary tools for the job, it is advisable to place the machine in an engineer's shop, or employ someone with the necessary equipment who has had some experience with machinery. Adjustments made in time before the parts become too much worn will save money and add years to the life of the machine.

Oiling:

Be careful to oil all moving parts thoroughly and often. **Do not forget.**

The Hay Stacker

So many types and makes of stackers are in operation in New Zealand today that only general recommendations can be made about their maintenance and care in their operation.

Many accidents and occasional loss of life have occurred in the past, and may occur again, unless all care and attention is exercised to ensure that all moving and wearing parts are in proper order and condition at all times. The rope or wire cable attached to the grab for hoisting the hay on to the stack is at times subjected to undue strains and is liable to break if there are any broken or badly-frayed strands. Examine carefully each morning before work commences, and if there is any doubt whatsoever about the rope's fitness, do not hesitate to renew it. It is a wise policy to have a spare rope on hand in case it is needed. Pulleys and blocks over and through which the rope operates should be examined periodically to make sure that the centre pins or axles on which they rotate are well greased or oiled, and to see that the split pins or nuts that hold them in position are not in any way worn and liable to break suddenly.

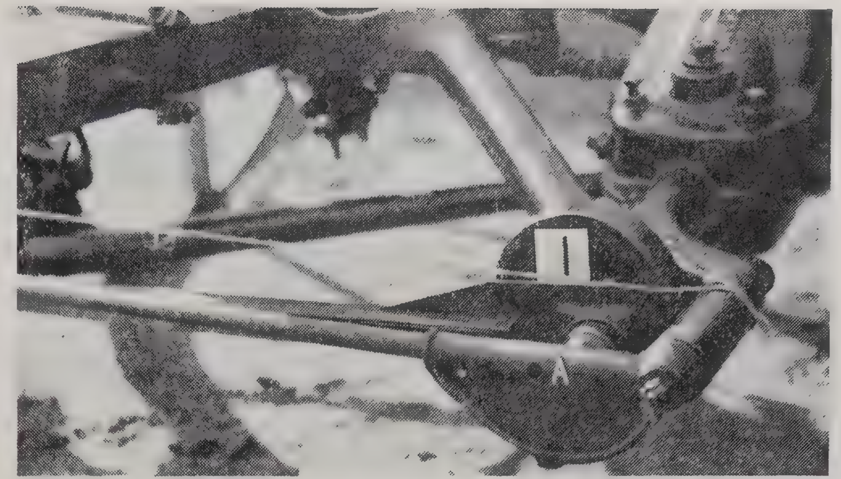

Fig. 1—Adjusting alignment of cutter bar by shortening fender bar at A.

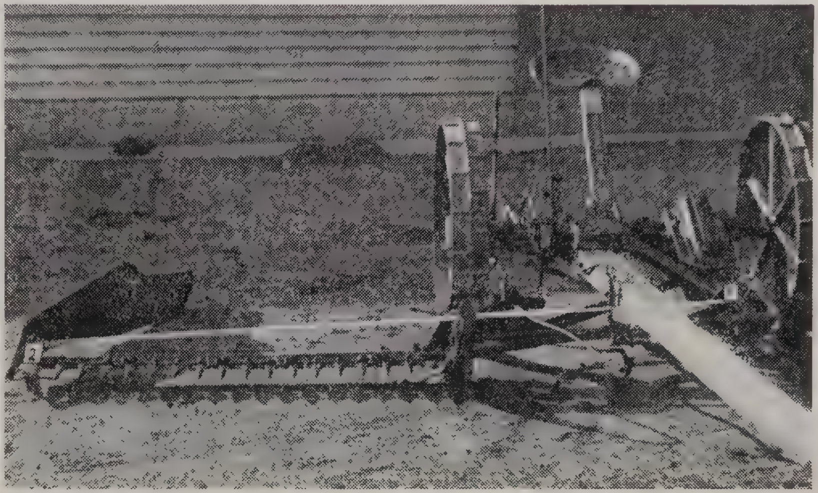

Fig. 2—Another method of taking measurements to check cutter bar alignment.

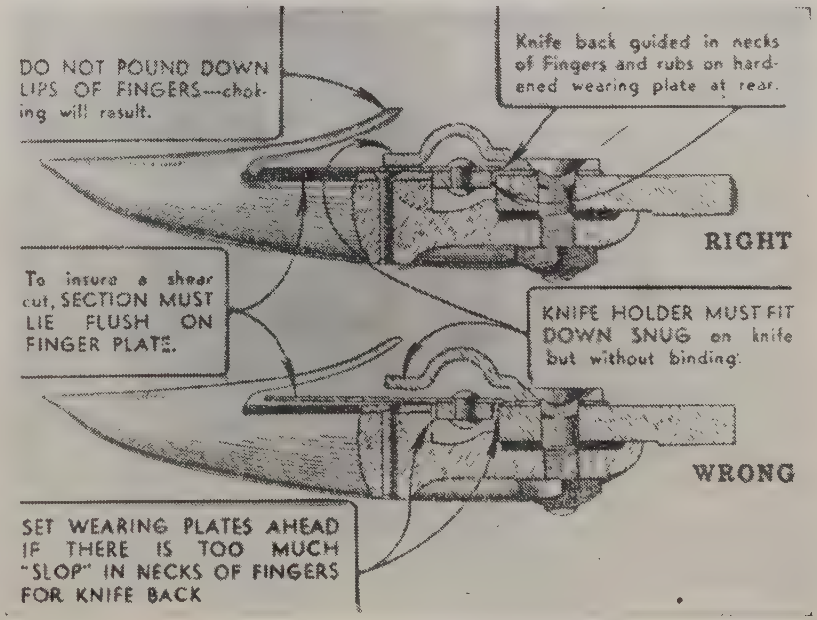
DO NOT POUND DOWN LIPS OF FINGERS—choking will result.
Knife back guided in necks of Fingers and rubs on hardened wearing plate at rear.
RIGHT
To insure a shear cut, SECTION MUST LIE FLUSH ON FINGER PLATE.
KNIFE HOLDER MUST FIT DOWN SNUG on knife but without binding.
WRONG
SET WEARING PLATES AHEAD IF THERE IS TOO MUCH "SLOP" IN NECKS OF FINGERS FOR KNIFE BACK

Fig. 3—Right and wrong knife settings.

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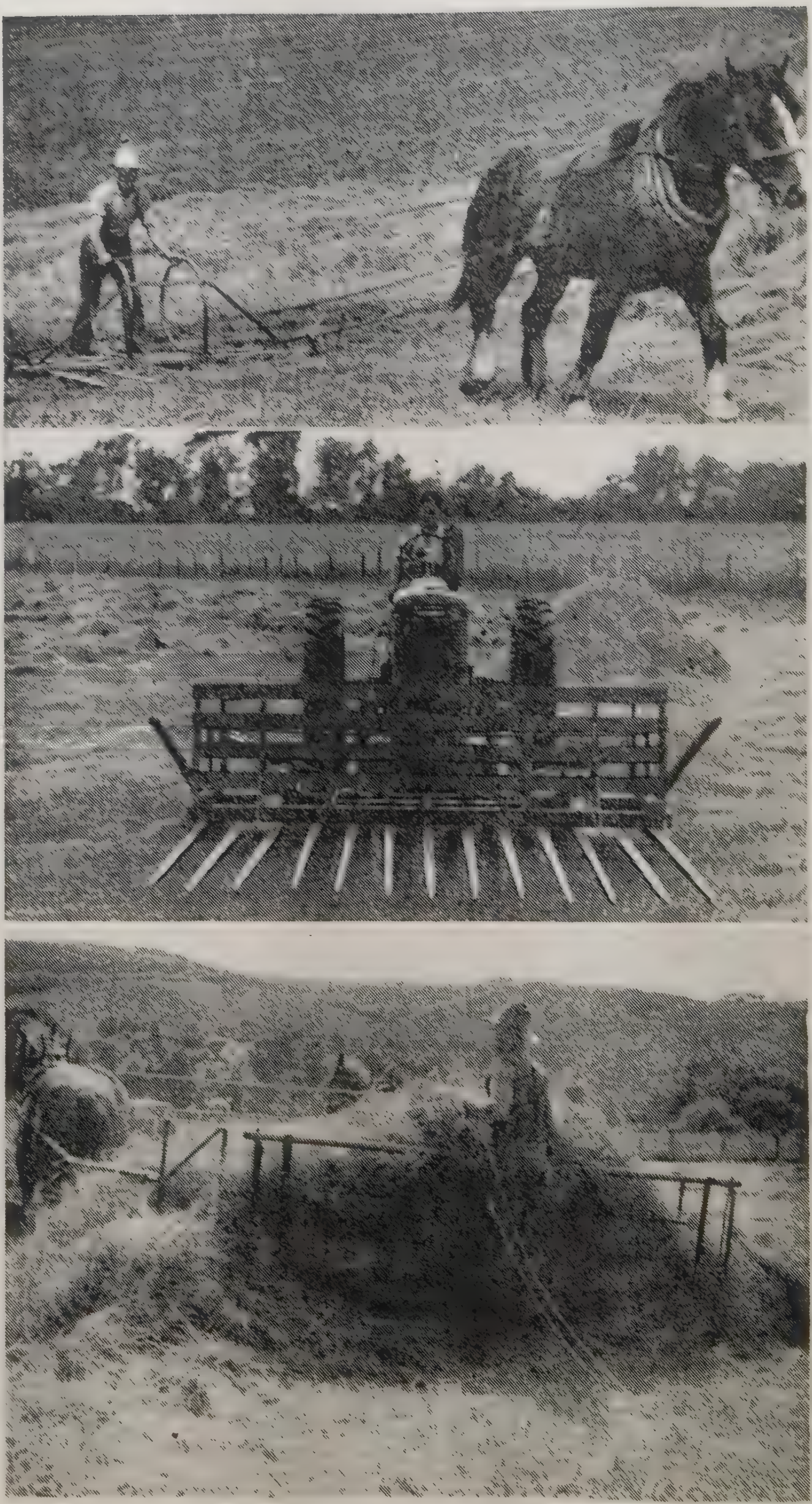
TYPES OF SWEEPS



Upper—One-horse tumber sweep. Middle—Two-wheel tractor sweep. Lower—Drag or gate sweep.

Particular care must be taken to see that the machine is securely anchored, and in the case of mast and boom stackers make sure that all guy ropes are securely fastened before commencing operations. This precaution is particularly necessary with a grab stacker when being used on silage, and especially after a night of heavy rain, when anchoring and staying pins are apt to pull out of the ground very easily if heavy strains are placed on them. If there is at any time a doubt about one peg holding, it is a wise precaution to drive in a second peg, allowing each peg to be 2ft. off the centre line of pull. These two pegs should be driven in at an angle of 45 degrees leaning away from the points of resistance. A rope is then passed with a double wrap around these two pegs at ground level and securely tied. The guy rope from the stacker is then passed around the strands of rope midway between the two pegs, and when drawn sufficiently tight, tied securely, allowing the strain to be distributed between both pegs.

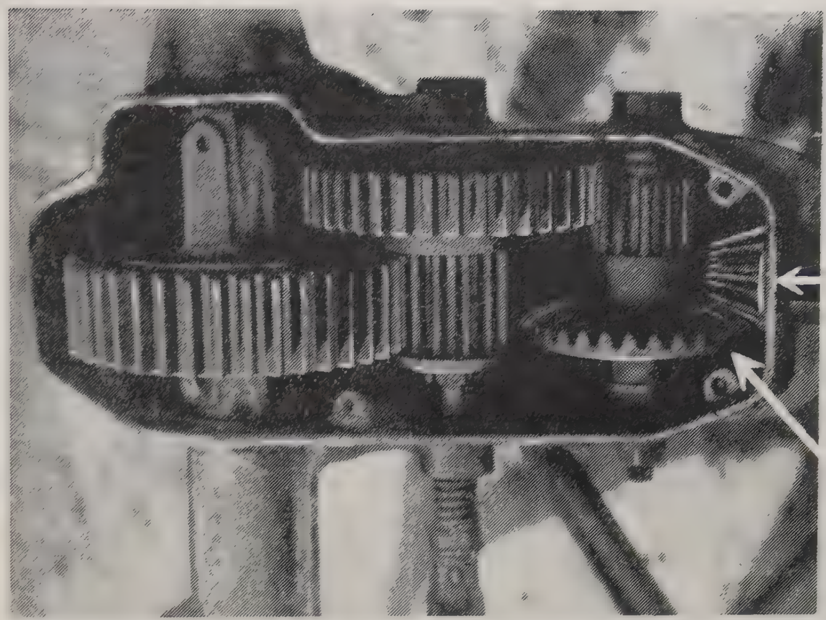


Fig. 4—The gear assembly that runs in oil. Usually greater wear occurs in the bevel gears indicated by the arrows.

Never erect a stacker too near an electric power line, and when transporting a stacker that is designed to travel in an upright position make absolutely sure there is sufficient clearance before attempting to pass under a live cable.

As soon as the stacking of the hay crops have been completed for the year all parts of the stacker should be thoroughly examined to make sure that every portion is in good sound condition. Any badly-worn or damaged parts should be repaired or replaced without delay. Quite a number of farmers are inclined to leave the overhaul and repair work until a few days before the machine is required, which often leads to the discovery of defective parts that the local agent or dealer may not be able to supply and which have to be ordered from a distance. Also, some of the repair work which can be done on the farm is done hastily, and perhaps not as efficiently as it would have been done if the person doing the work was not so pressed for time. The result is usually a late start, and perhaps a breakdown, just as everything is commencing to run smoothly. All stackers wherever possible should be kept under cover during the months they are not being used.

Horse-drawn side-delivery rake.

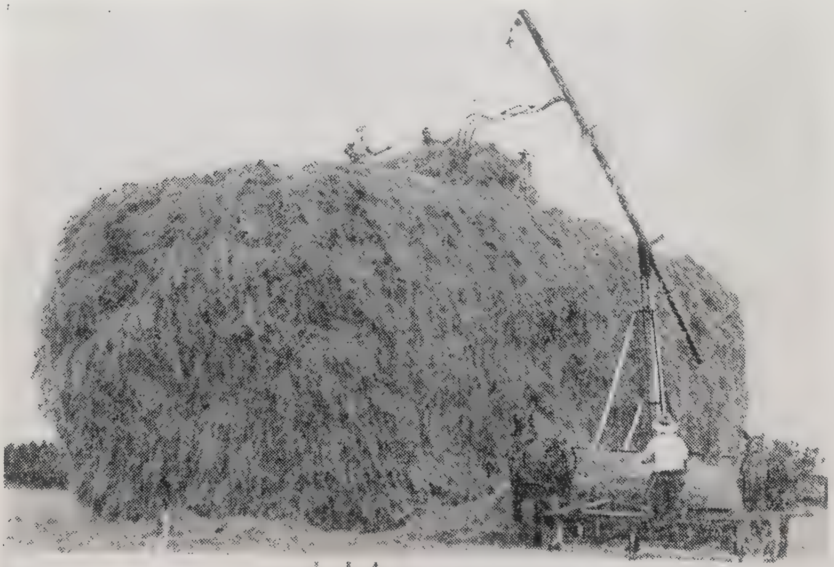
Swath Turners, Tedders, Rakes

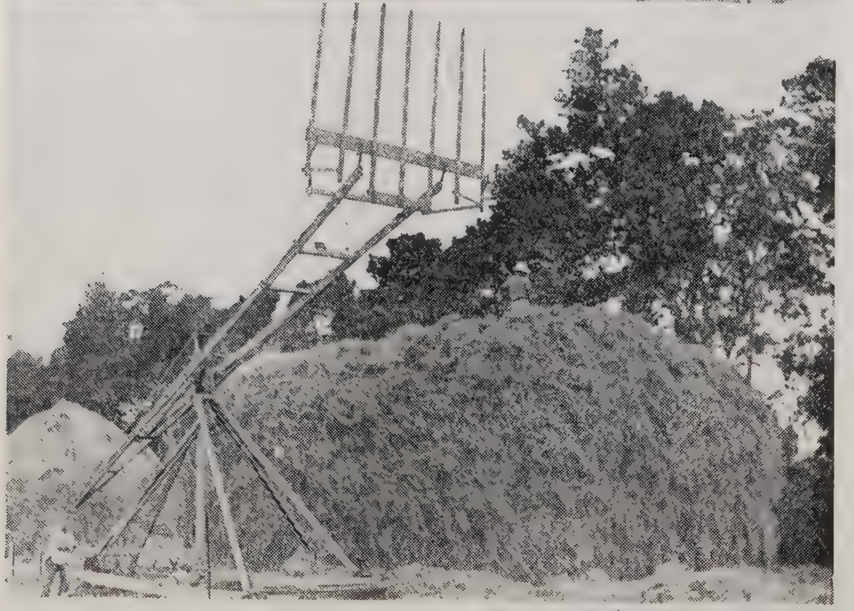
The swath turner is a most useful machine for speeding up haymaking and is usually made to turn two swaths—two widths of grass cut by a 5ft. mower. These swaths are turned independently, and if the machine is operated in the same direction of travel as the mower, it will practically turn the mown grass upside down with the leaves turned inwards and the stems outwards, thus protecting the leafy portions from the fierce sun. Such good turning cannot be accomplished in any other way than by following the line of travel that was taken by the mower.

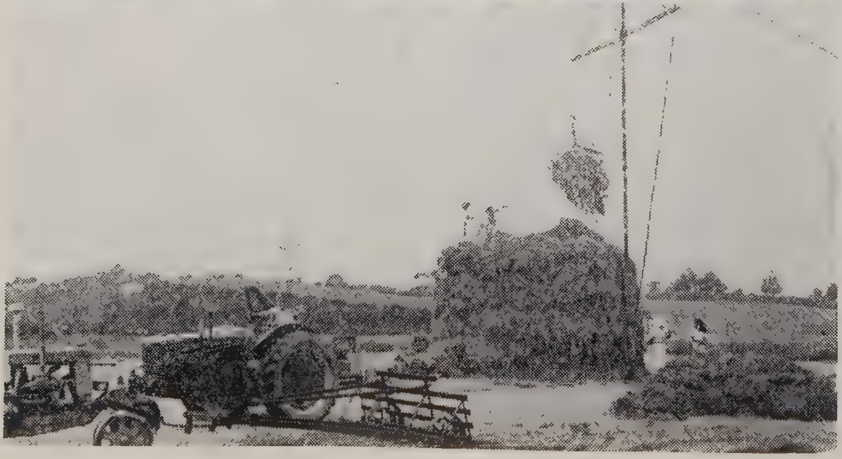
Swath turners vary a good deal in construction, and the method of operating one make does not always apply to another make. Carefully preserve the operational instruction book, and be most careful to follow the instructions given in it.

The combination swath turner, side rake, and tedder is so designed that it will turn two swaths at a passage. With heavy crops and during poor drying seasons the machine will work as a tedder, completely pulling out and spreading all matted grass and exposing a greater drying surface to

TYPES OF STACKERS







sun and wind, or it will operate as a side rake, making windrows very quickly and efficiently.

As these machines are somewhat complicated in construction, the makers' instructions should be strictly followed, and no attempt made to make any major alterations while the machines are in motion.

Although these machines work well and are easy to operate on land with an even surface, they need care and judgment when operating on land where the surface is uneven and full of small depressions and slight hummocks. Many a machine driven over a hummock has been badly strained by striking the centre of the reel on the ground. To overcome this danger some makes of machines are equipped with one or two castor wheels in the rear, but with machines not so equipped the best method to prevent damage when a bad hummock is noticed is to pull to one side so that one of the side wheels will pass over the centre of the obstruction and lift the reel clear.

The side rake is considered an essential companion implement to the pick-up hay baler and when intelligently used plays a great part in producing good-quality hay.

A Waikato farmer who owns a side rake and pick-up baler has adopted the following technique, and during reasonable seasons makes a good-quality hay. When making silage four swaths are cut around the margin of each hay field and carted off, so that the grass when cut for hay can be turned three times in the same direction, with the rake operating in the same direction of travel as the mower, without piling three swaths together in a big heap alongside the fences. The procedure then is as follows:—

First day: Start mowing as soon as the dew has dried off the grass, say about 8.30 to 9 a.m., and cut for about 4 hours. Cease cutting for the day. At 4 p.m. commence turning with the side rake into a small windrow.

Pig Broadcasts

UNDER the auspices of District Pig Councils broadcasts will be delivered in March, 1946, as under:—

Auckland—1YA, on March 20, at 7.15 p.m., "Selection and Care of Breeding Stock," by H. E. Clark, Supervisor, Auckland District Pig Council.

Wellington—2YA, on March 19, at 7.15 p.m., "Litter Production," by C. H. M. Sorensen, Supervisor, Taranaki District Pig Council.

Napier—2YH, on March 12, at 7.15 p.m., "Feed Values and How to Assess Them," by H. A. Hopkins, Supervisor, Tairawhiti District Pig Council.

Second day: Start mowing again at 8.30 or 9 a.m. and mow for say four hours. Then re-turn first day's mowing, and, for the first time, second day's mowing.

Third day: About 11 a.m. again re-turn first day's mowing, and about 4 p.m. start to turn, for the second time, the second day's mowing. Proceed with the pick-up baler and bale first day's mowing; and place bales under cover.

Fourth day: About 11 a.m. start to make into windrows the second day's mowing. Proceed with baler and finish baling and place bales under cover.

Windrows should be made large enough to keep the mouth of the baler full all the time. Larger windrows are apt to jam or block the elevator; on the other hand, if made too small, loss of time will occur, as the baler will have to travel a greater distance than is really necessary for packing and tying each bale. Should the side rake make a windrow too wide for the baler, the width can be cut down by taking some teeth off each section of the right hand end of the reel.

Pick-up hay baler.

Hay Sweeps

Various types and patterns of hay sweeps are to be seen in operation during the haymaking season. The majority are equipped with wooden teeth. Some, of course, are all steel, but they are not generally used. Several types of horse-drawn sweeps are used, but possibly one of the most favoured of the two-horse types is the four-wheeled sweep because of its light draught when fully loaded.

The tractor-operated sweeps are becoming more popular every year, because of their speedy operation, and when run in conjunction with a suitable stacker they greatly hasten the work of hay saving and stack building.

Provided the necessary attention is given in the way of keeping bolts and nuts tight, there is very little that can go wrong with the modern sweeps. A tooth is apt to be broken occasionally when working on land with an uneven surface or on soft soil where the wheels are inclined to sink and the points of the teeth catch. It is advisable to have a number of spare teeth always on hand so that when a breakage does occur no great time is lost in repairing the damage.

When stacking is finished each year all teeth should receive a good coating of raw linseed oil, and other woodwork as well as iron and steel work should be painted before placing the implements under cover.

◆

The weight of a cubic foot of roots in a clamp or pit is as follows:—Turnips, 33lb.; swedes, 34lb.; mangolds, 35lb.; carrots, 31lb.; parsnips, 31lb.; potatoes, 42lb.

Windrowing with a swath turner.

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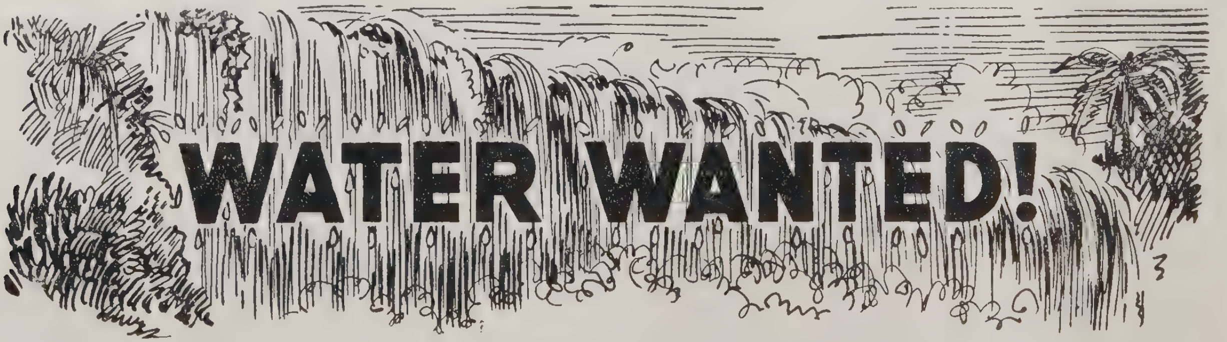
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REMOVAL OF SURPLUS HONEY

By E. SMELLIE, *Apiary Instructor, Christchurch.*

PROVISION of suitable hive accommodation and ventilation is most important in the very hot months of January and February, especially in southern districts where the honey flow is later than in other parts of New Zealand. Where bees are cramped for room, they cannot be expected to store a large surplus of honey.

AT least three full supers of combs for each hive are usually necessary for the storage of honey. These should be placed on the hives ahead of requirements.

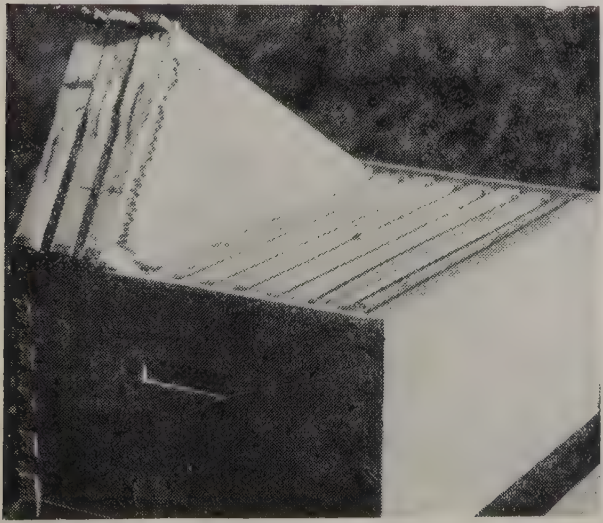
Where colonies are very strong, a good plan is to raise the hives from the bottom boards by inserting small blocks of wood sufficiently large to give the entrances an extra inch in height, but any extra entrance should on no account be left open when the honey flow is on the decline, otherwise robber bees will be troublesome.

Some beekeepers who have a large supply of drawn combs on hand prefer to leave the honey on the hives as long as possible. Where a good flow is being experienced, however, most beekeepers prefer to remove and extract the honey when available. The empty wet combs in such instances are then returned to the hives for additional storage of incoming nectar. These wet combs can be returned to the hives at any time of the day during a honey flow, but when the bees are not gathering actively these combs should be returned in the evening when flying has ceased.

Drawn Combs Only

When the flow of nectar is on the decline drawn combs only should be utilised, as the bees cannot then be relied upon to build and fill combs fitted with foundations.

In removing honey from the hives for extraction, only those combs which have the cells completely capped or sealed by the bees should be taken. This precaution must be observed otherwise there is a danger of extracting honey from which excess moisture has not been removed by the bees, resulting in a lower grade product which may ferment when placed in storage. It is generally recognised that the bees do not cap or seal honey until it is ripe; if care is taken to extract only completely-sealed honey (or at least 95 per cent. sealed), there will be little danger of fermentation from this cause.



Fully-capped combs ready for removal from the hive.

Super of honey over bee escape board now free of bees being removed from the hive.

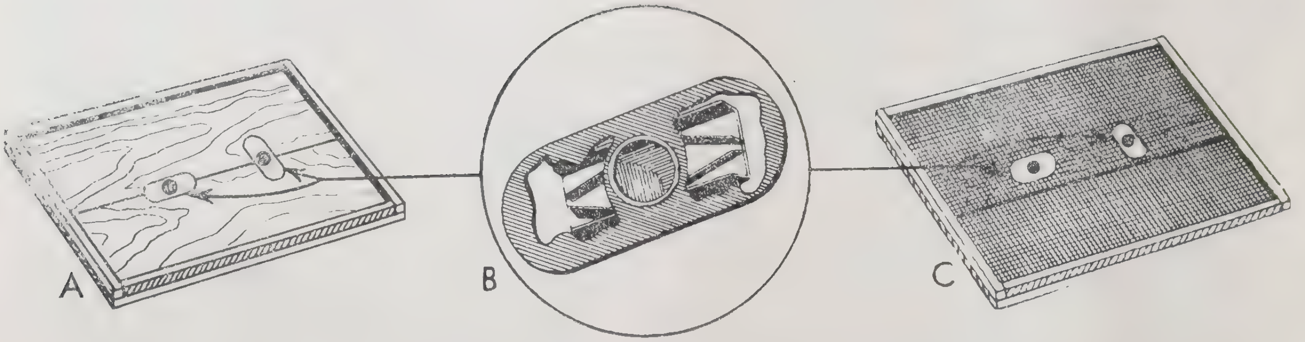
Precautions should be taken to ensure that combs containing brood are not removed from the hives. These should be left until the brood has hatched before extracting them. Where queen-excluders are in general use, this will not be troublesome.

Most satisfactory and safe method for the removal of surplus honey is by bee escape boards. Each board is made to the outside top dimensions of the hive and fitted with one or two Porter bee escapes (one on each side slightly away from the centre as illustrated is best) and double outlet escapes guard against the possibility of blockage either by an injured bee or by any projecting burr comb.

Bee escape boards are placed under the supers containing the surplus honey the evening before removing the honey. By next morning the bees will have passed to the supers below and, as they are unable to return, the supers can then be removed bodily without the bees having to be brushed off.

Warmth Necessary

A disadvantage in using the board type of bee escape is that the honey sometimes becomes cold and harder to extract. For this reason some beekeepers prefer the Hodgson ventilated escape "board," which has the Porter escape traps fitted into wire mesh screen. This escape board allows warmth from the colony to ascend through the wire mesh and keep the honey in the supers above sufficiently warm for easy extraction. When this escape board is placed well above the brood nest it is very effective; but if placed under the third super or near the brood cluster, many bees may remain above where there is warmth and where



A. Bee escape board (wood). B. Porter bee escape. C. Hodgson ventilated wire type of bee escape.

they can maintain contact with the colony cluster directly below, through the wire mesh.

When escape boards are not used in hives where there are several supers of honey to be removed the work may be better and twice as quickly done by two people than one. While one uses the smoker and wheelbarrow, the other removes the frames of honey one by one. After giving each frame a sharp shake to dislodge the bees, he hands it to the person in charge of the barrow, who brushes off any remaining bees with a bee brush, and places the frame in an empty super on the barrow. A clean sack should be used to cover the combs as soon as each super is filled.

In apiaries where there is the slightest danger of foul-brood being present, great care must be taken to avoid dropping any honey on the ground. It is therefore advisable to place the supers in drip trays on the wheelbarrow for removal to the honey house. A bee brush in the hands of a competent beekeeper may be used occasionally to advantage, but in general this method is slow and laborious, and in the autumn accelerates robbing, making it hard for the beekeeper to continue without serious consequences.

Disinfectants

Another method tried by some beekeepers is the application of strong disinfectants to the top of the hive with the aid of specially-constructed screens. While in this way bees are quickly driven down out of the supers, the method is not recommended for the safe removal of honey. Considerable experience in recent years has shown that no matter how careful the beekeeper is, the honey is contaminated to a less or greater degree according to the method of application. While carbolic taint is not always noticeable the natural delicate flavour and aroma of the honey are impaired.

To take more honey off the hives than can be extracted the same day is inadvisable, unless special arrangements have been made in the honey house to keep the honey warm overnight. In some of the larger apiaries rooms are insulated and kept warm artificially to prevent honey getting cold. These warm rooms are of particular value where honey in large quantities is brought in from out-apiaries, especially late in the season when temperatures are cooler.

Honey in a damp or humid atmosphere, whether in the combs or in the storage tanks, rapidly absorbs moisture. For this reason it should be properly covered. Extracting should be done only in dry weather.

Essential Work

Attention to the extracting room before removal of any honey from the hives is essential. All unnecessary material should be cleared away to leave plenty of working room. The floor and walls of the honey house should be given a good scrubbing with hot water and allowed to dry. All utensils used with honey must be thoroughly cleaned before and after use. The extractor, honey tanks, strainers, the uncapping knife, and rubber steam tubes should be cleaned with boiling water and tested to ensure that they are in good working order.

Examination of the steam boiler and cappings reducer completes the inspection of the more important appliances.

Success in any business cannot be achieved without adequate preparation. Adjustments to appliances should be made immediately to prevent a possible serious hold-up during honey harvesting and packing operations.

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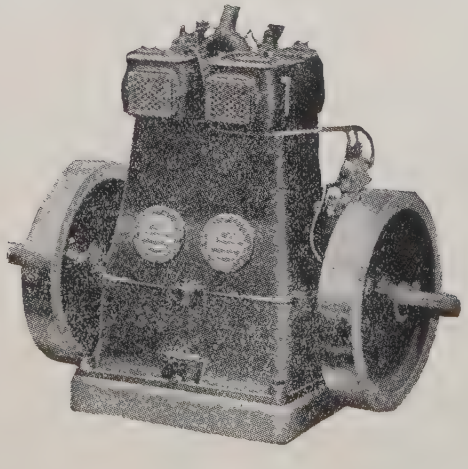

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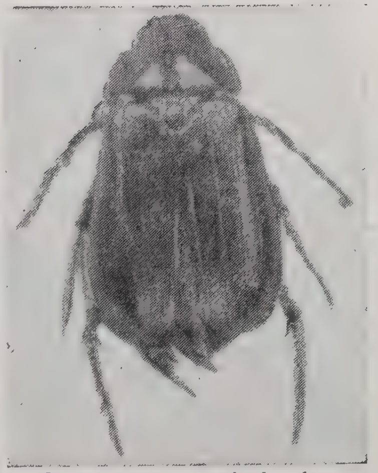
Grass-grub and Porina

THE native pests grass-grub and porina are responsible annually for destruction in many thousands of acres of pasture and large areas of other crops. Porina is the name by which the subterranean grass caterpillar of the moth (*Oxycanus* species) is known. Control measures for porina are quite ineffectual for the grass-grub, and it is therefore necessary for the farmer to be able to distinguish between damage effected by the two caterpillars. Both may be present in the ground from late November until late August. By April damage will have caused bare patches in pasture and feed will be still further reduced over the winter according to degree of infestation.



Common grass-grub beetle.

DAMAGE to pasture plants, both grasses and clovers, by porina is restricted to the crown and foliage. The grass-grub, however, attacks the roots of grasses and cereals. Light, medium, and friable soils are more subject to widespread grass-grub attack. Porina infestation is more localised and may be more troublesome than that of grass-grub on heavier soils. Both may be present in the same field, however.

The Porina Caterpillar

The colour of the porina caterpillar varies, being principally a grey-green. Size varies according to age, a length of about 2in. being attained. The caterpillars feed on the surface at night, but during the day they may be found 6 to 9in. down in their vertical burrows. The characteristic holes, about the diameter of a lead pencil, and the bared pasture patches indicate their presence.

Although developed only over the last few years, control of porina in badly-affected areas has followed topdressing with poisoned bait. One application costing about 8/- per acre kills about 80 per cent. of the caterpillars and reduces further severe damage in a pasture over winter, if topdressing is sufficiently early.

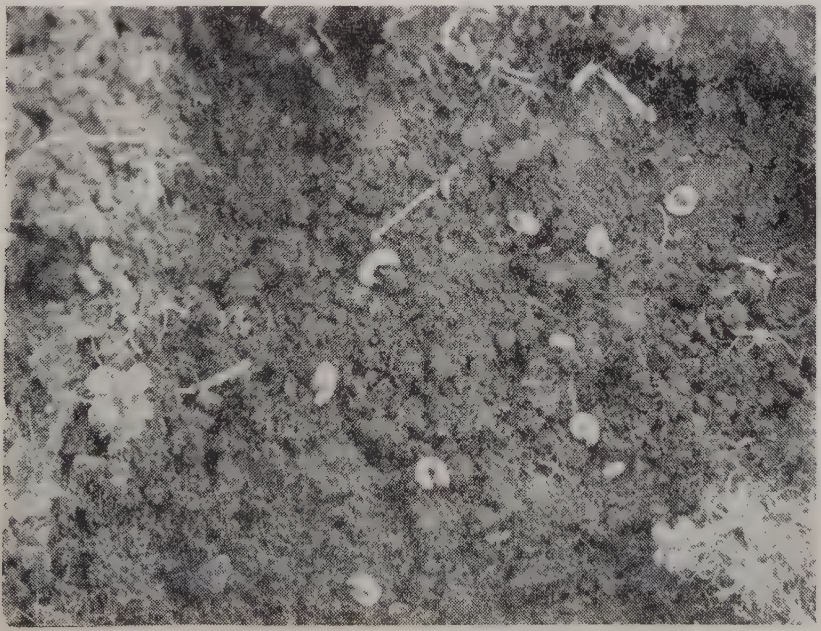
The poison bait recommended per acre is as follows:—

4lb. arsenate of lead or 2lb. Paris green.
50lb. bran.
6 gallons of water.

The poison and bran are mixed dry and sufficient water is then mixed in to moisten the bait to a state satisfactory for a topdressing implement in the case of a large area. Every care should be taken in handling the poison.

Grass-grub

Grass-grubs are found among grass roots about an inch below the surface. The body of the caterpillar is characteristically curved in a horse-shoe shape and is creamy in colour. Injury to the roots causes the foliage to die off until it is easily lifted. Because the soil passes through the caterpillars, the ground is left in a spongy condition.



Grass-grubs in a damaged pasture.

It has been estimated that the annual net loss in income with Canterbury farmers alone is over £500,000. No economic method of controlling grass-grub has been discovered, and in areas subject to severe infection farm management practices require some modification to reduce losses to a minimum.

Because of the serious effect on winter feed, heavy reserves of dry feed such as oats and hay are required.

Lucerne once established withstands the grass-grub, and a larger area of lucerne than is normally needed for hay might be grown. Grazed with care and with one hay crop taken annually, a lucerne stand will last quite well where grass-grub is prevalent.

On infected farms the provision of a strong paddock of Italian ryegrass and red clover or greenfeed oats sown on fallowed ground will provide welcome feed in the early spring for the breeding ewes. A tendency towards being slightly understocked rather than overstocked will bring the stock better through the winter.

Early sowing of cereals on badly-infested paddocks should be avoided. If late winter or early spring sowing is unsatisfactory in a district, the least-infected paddocks should be reserved for the cereals. Peas, rape, or turnips could be spring sown on the more infected areas. As rape and turnips are attacked by the adult grass-grub beetle, which also lays eggs in such crops, sowings should not take place when the beetle is on the wing about November or early December.

Patches in a pasture which have been badly attacked by grass-grub may be improved by feeding out hay, sowing additional seed, and spelling.

—*E. M. BATES, Instructor in Agriculture, Alexandra.*

HARVESTING CHOU

AT LEFT:
Upper—Direct heading a crop of chou moellier.

Middle—Chou moellier stubble after direct heading. Any of the crop broken down is missed by the header.

Lower—Chou moellier in stook.

ABOVE:
A heavy seed crop of chou moellier.

MOELLIER SEED CROP

By G. K. McPHERSON, Instructor in Agriculture, Ashburton.

IN many ways a chou moellier seed crop is one of the most difficult farm crops to harvest satisfactorily, one of the first complications being the decision on the most suitable time to commence harvesting. As with all other members of the cabbage family to which chou moellier belongs, the seed tends to ripen very unevenly; on the one plant may be found pods containing almost dead-ripe seeds and other pods in which the seed is quite green, so that it is often difficult to decide when to commence harvesting.

IF the crop is left too long before cutting, there is a risk of loss of seed through shaking, and if it is cut too green, too much immature seed is likely to result. Again, in many cases, the thick and hard stalks of the chou moellier plant may present a problem, not only when it comes to cutting the crop, but when threshing it as well. If the stalks are thick, they are inclined to be very troublesome when cut with the binder, particularly on the binder canvases, and also on the knotter parts. Very thick stalks also present problems in threshing the crop, particularly if a header harvester is used. A threshing mill can handle the thick stalks more efficiently than the header harvester.

The threshing of the crop also requires careful attention if cracked seed is to be avoided. Some of the cracked seed can be removed in the machine dressing, but not all. As a very small percentage of cracked seed shows up very clearly and spoils the appearance of the line, it is essential while threshing to reduce the quantity of cracked seed to a minimum.

Time to Cut

Whether a crop is cut with a binder, a mower, or by other means, it is difficult to gauge the time to commence cutting to obtain the maximum amount of good seed.

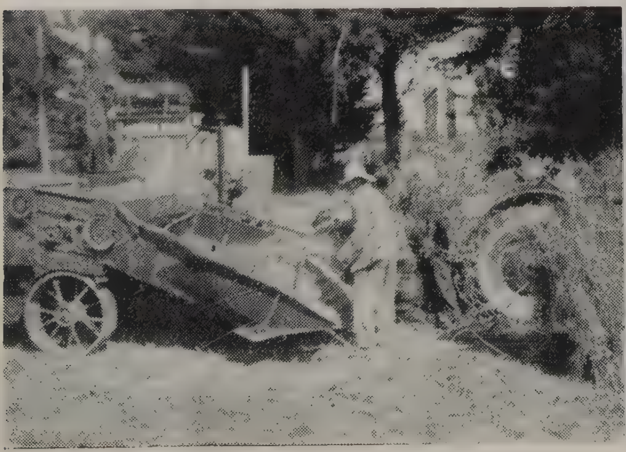
Experience suggests that if a representative sample of pods at all stages of ripeness collected from the standing crop is found to contain approximately 25 per cent. of ripe seed, 25 per cent. of green seed, and the remaining 50 per cent. of the seed is slightly coloured or mottled, the crop is at a suitable stage of maturity for cutting. This stage may be considered by some to be somewhat green to start cutting, but it has to be remembered that the relatively thick stalks contain a considerable amount of sap, which enables the crop to mature in the sheaf to a greater extent probably than many other crops.

Method of Cutting

The most common method of harvesting is to use the reaper and binder, preferably one with a power take-off, and tie the crop into sheaves. For this purpose the binder is set to cut as high as possible to avoid the thickest part of the stems. To minimise the loss of seed a dull day should be selected for cutting the crop or cutting should be confined to early morning or evening. On a hot day the pods crack open very readily. The sheaves should be made slightly on the small side; relatively small sheaves are easier to handle, mature more quickly, are easier to spread out, and provide more even feeding to either a mill or a header harvester than do large sheaves.

A few years ago it was a common practice to stook the crop after cutting. It is not an easy matter, however, to stook chou moellier on top of tall stubble, so that most farmers nowadays prefer to lift the sheaves as they are dropped off the binder, and place them singly on top of the tall stubble and out of the wheel tracks. With normal weather conditions three weeks to a month may be necessary between the time of cutting and the time of threshing.

Should a crop be a very heavy one, strong winds and rain before harvesting may so break and tangle the stalks that it is not possible to cut it with the binder, when the only alternative would appear to be to cut the crop with a mower and tie it into sheaves by hand. Naturally this is a very expensive method and could be considered only where the returns warranted the expense involved. Furthermore, a mower, unlike a binder, can cut only close to the ground, so that when a crop has to be cut with a mower the problem of dealing with the thick stalks is



Left—Feeding the sheaves into a header harvester.

Right—Threshing chou moellier with a "tin" mill.

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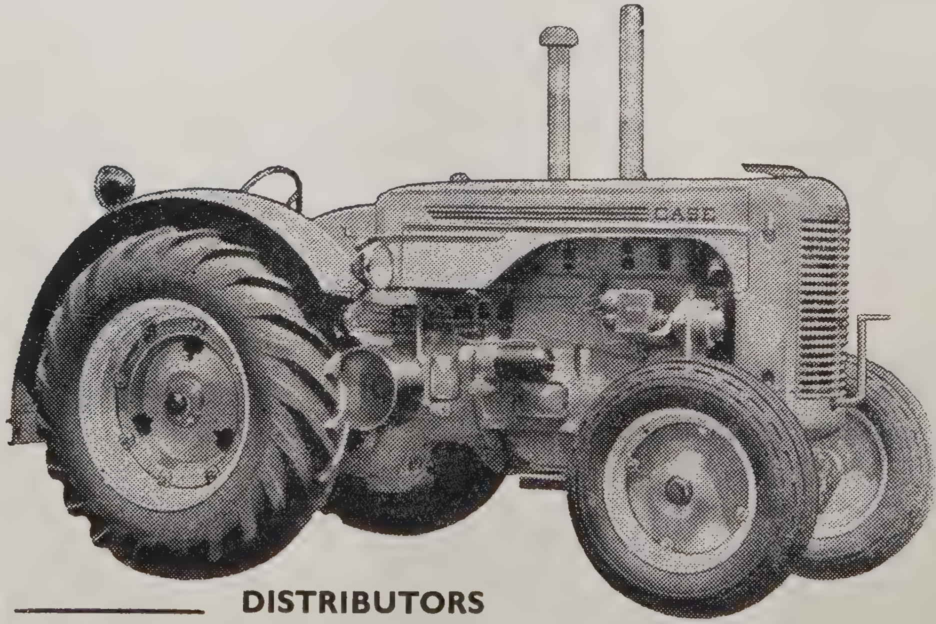

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still further aggravated. To facilitate the stooking and the threshing of a crop cut in this way, particularly if the threshing has to be done with a header harvester, it may be advisable to cut off the thick stalky ends of each sheaf before stooking the crop.

Another method employed occasionally, but only with a light crop, is to windrow it with a binder. However, the loss of seed by this method is likely to be very much higher than where the crop is tied into sheaves

Threshing

The method of threshing the crop depends almost entirely on the type of machinery the farmer has available for the job. Where a threshing mill and the necessary labour can be obtained it is the usual practice to thresh the crop by this means. Nowadays, however, very few farmers possess a threshing mill and most threshing from the sheaf is done with a header harvester.

Where a large area has to be threshed, and an engine-driven header is available, five men are usually employed. The header is drawn slowly along the line of sheaves, there being one man on the tractor, two men forking to the header, a feeder, and a bag sewer. On the other hand, where the crop is a very good one and the area relatively small, the header may be left stationary and the sheaves brought in to it. When threshing of the crop within a reasonable distance of the header has been completed the header is moved into another part of the paddock.

Cutting of the bands and using the header pick-up have been tried, but the loss of seed was so great that this method is not now practised.

A broken-down crop of chou moellier is very difficult to harvest.

Direct Heading

One crop at least was successfully direct headed during the past season. The crop was a very good one averaging about 6ft. in height, and most of the stalks were fairly thick. The farmer tried to cut the crop with the reaper and binder, but part of the machinery broke, so he decided to try direct heading. With normal adjustments the header used would cut approximately 24in. from ground level. In this case special adjustments were made which lifted the front another 6 to 9in., so that the machine was cutting at a height of 30 to 33in. As it was a tall crop, the fans, by special adjustment, were also set well forward, which facilitated the movement of the crop on to the elevating canvas. As a result most of the thick stalky ends were avoided and little difficulty was experienced in the cutting of the crop. The raising of the drum for the threshing increased the clearance, and the speed was regulated so that cracked seed was reduced to a minimum.

The use of an engine-driven machine for heading this crop appeared advantageous, as travel speed variations could be made by throttle as well as gears, which enabled the unit to slow down and maintain a full cut even in the very heavy part of the crop without the speed of the header mechanism being altered.

The crop was headed roughly 10 days later than when it was considered binder-ripe, and there was still some green seed and some partially-coloured seed present. About 30 to 40lb. of seed was put into a bag and the bags hung on fences for about a fortnight to allow the seed to mature before it was bagged into full sacks.

That this method of harvesting a chou moellier seed crop has possibilities, in some seasons at any rate. can be deduced from the fact that this crop yielded 746lb. of machine-dressed seed per acre, with a purity of 99.5 per cent. and a germination of 97 per cent. The advantages of this method are obvious. Labour requirements are reduced to a minimum and the job is done quickly. One man and a boy operating a 5ft. header direct headed 15 acres in 1½ days. However, a paddock with an even soil type to give evenness in ripening, together with an absence of strong winds just before harvesting, would seem requisites to success.

Cutting off the thick stalks facilitates both stooking and threshing.

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Ngaio Poisoning of Cattle

THE poisonous properties of the ngaio tree *(Myoporum laetum)* have long been recognised in New Zealand, but because of the sporadic nature of the stock losses occasioned by it, the tree has not been considered a serious menace by farmers, writes P. J. McCann, Veterinarian, Christchurch. However, that losses can on occasions assume alarming proportions, where the tree is plentiful, was demonstrated last year on Banks Peninsula, where 73 cattle died from ngaio poisoning following a severe gale and heavy snowstorm. In addition, a large number of cattle, which showed symptoms of poisoning and eventually recovered, lost condition badly and recovery was very slow.

THE tree is found chiefly in coastal districts, both in the North and South Islands as far south as Otago. It is abundant on Banks Peninsula, where it grows chiefly on hillsides from which the bush has been cleared. It is a small, round-headed tree, 8 to 30ft. high, with a trunk 9in. to 2ft. in diameter with a thick, brown furrowed bark. The leaves are lanceolate, 1 to 4in. long, bright green, hairless and somewhat fleshy, and dotted with translucent oil glands. It has small, white, purple-spotted flowers, and small, reddish-purple berries.

Poisonings Recorded

The following cases of ngaio poisoning have previously been recorded:—

In May, 1910, at Duvauchelle Bay, Banks Peninsula, 14 cows out of 35 were found staggering about. Two died in 24 hours and three more in another 36 hours. All showed symptoms of acute constipation. (1).

In May, 1911, at Palmerston, Otago, several cows in the district died with symptoms of extreme constipation and severe pain. (1).

In August, 1912, in Wairarapa, 5 died out of 18 two- to three-year-old bullocks. (1).

In May, 1918, several farmers lost cows at Moumahaki. (1).

In March, 1926, in South Wairarapa, out of 13 two-year-old Hereford steers, three died and two were seriously ill. (2).

In July, 1927, five young heifers died at Waikanae. (3).

In 1942, at Hawke's Bay, out of 44 Angus two-year-old heifers, 23 died three days after eating ngaio leaves from a tree blown down by a storm. (4).

In 1940 a number of pigs were reported to have died following ingestion of ngaio leaves (5) and in 1934 the tree was suspected of poisoning horses at Waverley. (3).

Although cases of poisoning of sheep by ngaio under ordinary field conditions have not been reported in this country, it has been shown by Drs. Cunningham and Hopkirk in experiments carried out at Wallaceville that sheep are susceptible to poisoning by the leaves and, to a much less degree, by the berries and wood. (4).

Cases of poisoning appear to occur only under unusual circumstances, such as following a storm, when branches of the tree are broken down and scattered over the pastures, and particularly in winter when feed is short. Under normal conditions stock do not appear to relish the leaves, or at any rate they do not eat it in quantities sufficient to cause poisoning.

Ngaio *(Myoporum laetum)*.

On July 13, 1945, an unusually severe gale occurred on Banks Peninsula and was followed next day by a heavy fall of snow. Branches of ngaio and whole trees were blown down and for a day or two they were the only feed available for stock. Within 48 hours of the commencement of the snowfall symptoms of poisoning were observed in cattle by several farmers, and within a very short time cattle were dying in many districts. On one farm 22 cows died out of a total of 29 and several other farmers suffered losses of from 4 to 6 cows. Although losses were widely distributed over the peninsula, they were heaviest in Takamatua district.

Symptoms

The most prominent symptoms in affected cattle were severe constipation and abdominal pain. Small quantities of hard, dry, blood-stained faeces were passed, and in more severe cases only a few small, dark blood clots were evacuated from the rectum. There was dullness, loss of appetite, cessation of rumination, a slight rise of temperature, dejected appearance, and in a few cows some icteric discoloration of the conjunctiva. It was stated by some farmers that one or two cows in the early stages showed unusual excitability and aggressiveness, but this was followed in a few hours by acute depression. A fairly constant feature was inflammation of the skin of the udder and teats, which were swollen and tender, and in many cases had deep cracks which bled readily. After several days the skin began to peel off the affected parts. The skin of the muzzle was also dry and scaly, while patches of dermatitis were frequently seen on different parts of the body.

Post-mortem examinations of several cows were made, and in each case the rumen or paunch was found to contain grass and twigs but showed no evidence of undue inflammation. The most striking lesions were found in the abomasum (fourth stomach), which was impacted with ingesta and severely inflamed. There was considerable hæmorrhage from the mucous lining of the stomach. The intestines were inflamed and hæmorrhagic but relatively empty. In each case the rectum was impacted with small quantities of hard faeces and exhibited the same intense inflammation which was present in the abomasum. In one cow there was catarrh and congestion of the gall bladder.

Treatment

Treatment of affected animals must be aimed at relieving the impaction and inflammation of the digestive tract, and further access to the ngaio must of course be prevented. Epsom salts are not a suitable purgative, as their action is on the bowels rather than on the stomach and owing to their dehydrating action they are not recommended for weak patients. The most effective treatment is probably the administration of large doses of raw linseed oil, of which up to two pints daily may be given. When pain is not severe a stimulant such as spirits of turpentine, a half to one tablespoonful, may with advantage be added to the oil. The animal should be encouraged to drink as much water as possible. A useful method of doing this is to rub a little common salt on the tongue. Enemata of soap solution should be administered at frequent intervals. If these are lukewarm, they are likely to be retained and will assist in softening the hard faeces in the rectum and at the same time stimulate bowel movements and relieve pain.

Discussion

The poisonous principle of ngaio is the essential oil present in the leaves. As it is sometimes a laborious job to gather all fallen branches and burn them, some farmers have asked how long the leaves and branches remain poisonous after they have fallen to the ground. Cunningham and Hopkirk have shown that ngaio leaves retain their poisonous properties even after storage for several months, and therefore it would be inadvisable to return cattle to the paddocks before the fallen branches have been cleared. On the other hand, as feed is generally available for stock after a few days and cattle are not likely to relish withering leaves, it is probable that no undesirable consequences would follow such action. Cases of ngaio poisoning seem to occur only in the absence of grass or other suitable feed.

Some farmers have successfully eradicated ngaio trees by ring-barking, and this should prove a practical method of dealing with the problem on most farms, but on premises which are too extensive and where the ngaio is too plentiful it would probably suffice to keep at least one paddock free of ngaio, to which stock could be moved temporarily when the danger of poisoning arose.

The apparent immunity of sheep to ngaio poisoning under natural conditions and their susceptibility under experiment raise an interesting problem for discussion. A possible explanation may be found in the behaviour of sheep which tend to seek shelter during storms as a flock and will remain together until conditions are more favourable for movement and feeding. Cattle are more venturesome and will wander further afield in search of food, sampling any plant or tree they may find.

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RECORD INCREASES

For the season ending June 30, 1945, the final production figures for creamery butter and factory cheese (excluding process cheese) were 151,600 tons and 103,500 tons respectively. These represented record increases of 17,200 tons with butter and 11,800 tons with cheese over the previous season's production. In the immediate pre-war season 1938-39, 144,700 tons of creamery butter and 85,100 tons of cheese were produced.

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Spraying Late-Harvested Apples and Pears

Compact Row-crop Outfit For Small Fruits

By A. R. GRAINGER, *Orchard Instructor, Christchurch.*

SOME varieties of apples and pears will not be ready for harvesting until well into April or early May, and, according to locality and weather conditions, orchardists may find it necessary to make the following spray applications:—

Bordeaux, ¾—1—50, on pears to prevent late black spot infection.

Bordeaux, ¾—1—50, on apples to prevent bitter rot (*Glomerella cingulata*) and/or ripe spot (*Neofabraea*).

Arsenate of lead powder, 1½lb. to 100 gallons water, to prevent late infection of codling moth (*Cydia pomonella*) or leaf roller caterpillar (*Tortrix sp.*)

White (summer) oil, 1—100, to control red mite (*Paratetranychus pilosus*).

Nicotine sulphate, 40 per cent. 1 pint to 100 gallons, plus activator, according to whether combined with other sprays or not for control of apple leaf hopper (*Typhlocyba australis*), which is more likely to be troublesome in southern districts at this time of the year.

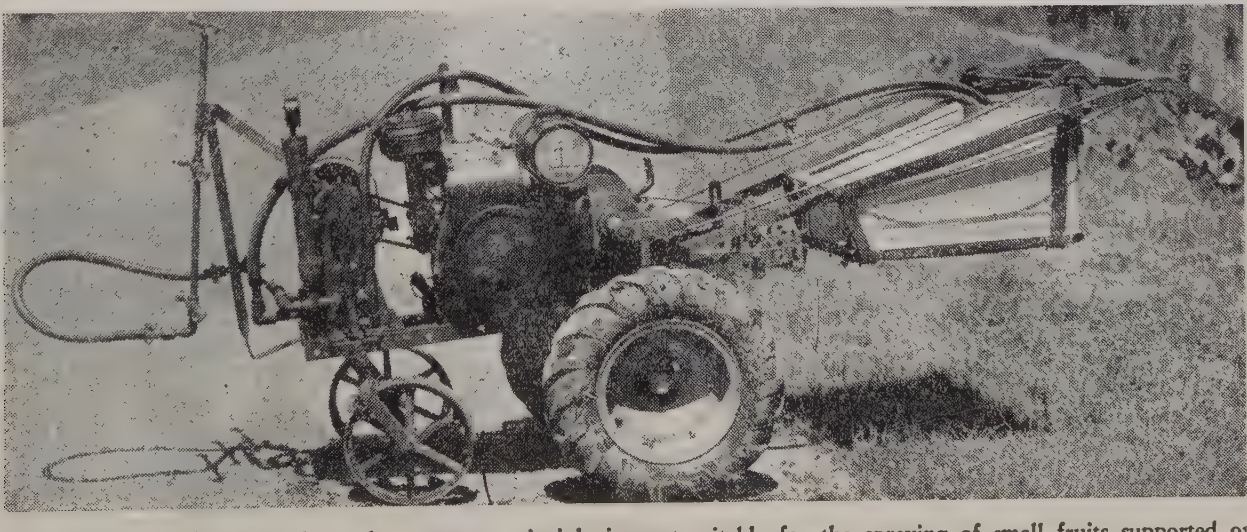
Spray applications during March should be made only after a careful study of the spray residue problem which is likely to result. Disease must be controlled, but it is also a specification of the standard grades that the fruit be "clean."

Small Fruits

Raspberries, loganberries, and boysenberries should be sprayed with arsenate of lead powder, 1½lb. to 100 gallons of water, plus Bordeaux, 3—4—50, the former to combat bud moth caterpillar (*Carposena adrephella*) and the latter for the control of cane wilt (*Leptosphaeria coniothyruim*).

Passion fruit vines should also be sprayed with Bordeaux mixture, 3—4—50, where there are any signs of brown spot (*Alpenaria passiflorae*).

The efficient spraying of those small fruits which are supported on wires or stakes, such as raspberries, loganberries, and passion fruit, is becoming increasingly necessary, and those growers who do not possess suitable apparatus are recommended to consider its purchase. As the rows of plants or vines are comparatively close together when in full foliage, some compact type of sprayer is desirable. The one illustrated is designed on the row-crop principle, except that the rod holding the nozzles is vertical instead of horizontal. The rod is fitted with three fixed nozzles and spraying is effected by driving along each row. The capacity of the spray tank on the machine illustrated is too small for most economical working, and a larger one would save time in filling up.



This compact outfit designed on the row-crop principle is most suitable for the spraying of small fruits supported on wires or stakes.

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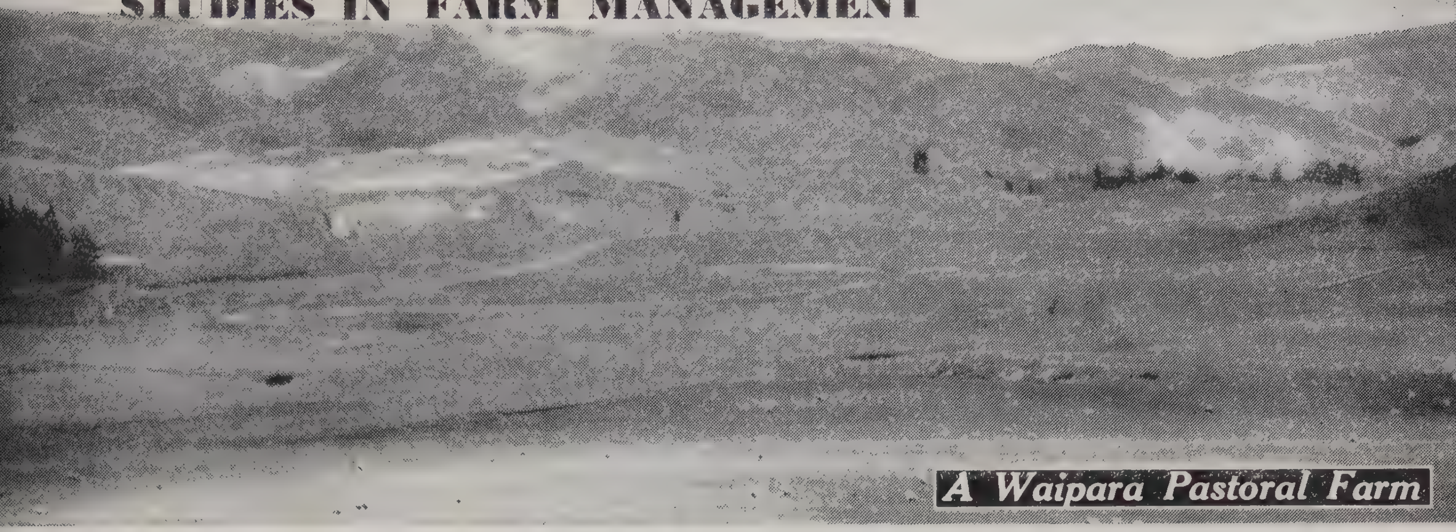
STUDIES IN FARM MANAGEMENT



A Waipara Pastoral Farm

FARMING operations in the Waipara County, North Canterbury, vary from mixed farming, where wool, fat lambs, grain, and small seeds are produced, to pastoral farming, where sales of wool and store sheep and cattle are the main source of income, with a few farms in this latter class disposing of a proportion of lambs as fats.

By **E. G. SMITH**, *Fields Instructor, Rangiora.*

THE Waipara County has four natural, well-defined boundaries, the Hurunui and Waipara Rivers in the north and south respectively, the sea-coast in the east, and the Southern Alps in the west. The county has a wide range of soil types, varying from rich alluvial flats, such as are found in the Omihi and Waikari Valleys, to light, stony land, good limestone downs, and steep hill country. The coastal area consists chiefly of downs and low hill country (up to 1,300ft.), while towards the western boundary mountainous country studded with peaks up to 6,600ft. in height is characteristic. The higher ranges are built up almost wholly of the older sediments—argillites and greywackes; the coastal zone is composed of the younger sediments and alluvium. Chief townships of the county are Waikari and Hawarden.

Climate

Rainfall figures taken at Happy Valley, the station nearest to the pastoral farm described in this article which records these particulars, show the monthly average rainfall over the last 10 years as follows:—

	Inches.
January	2.03
February	3.15
March	3.15
April	3.08
May	2.94
June	2.53
July	3.46
August	2.50
September	3.05
October	2.26
November	2.33
December	3.31
Total	33.79

The climate of the coastal region is mild; further inland, however, frosts are frequent from the end of April to September. Although snow seldom lies for more than a few days on the low country, heavy falls which cause stock losses are not uncommon on the higher levels.

Farming Operations

Farming operations in the county vary from mixed farming, where wool, fat lambs, grain, and small seeds are produced, to pastoral farming, where sales of wool, store sheep, and cattle provide the main source of income. On some grazing runs, improved methods of management have resulted in the disposal of a proportion of the lambs as fats.

The total area of Waipara County, as shown in the Agricultural and Pastoral Statistics for the year 1943-44, is 460,827 acres. Of this area 132,817 acres have been under cultivation. The area of unimproved land is 328,010 acres.

The following tables show the numbers of stock and the areas of main crops in the county in the year 1943-44.

TABLE 1—LIVESTOCK.

Horses	1,632
Cattle	7,704
Dairy cows	1,117
Pigs	358
Sheep shorn	372,881
Lambs shorn	6,071
Lambs tailed	218,705

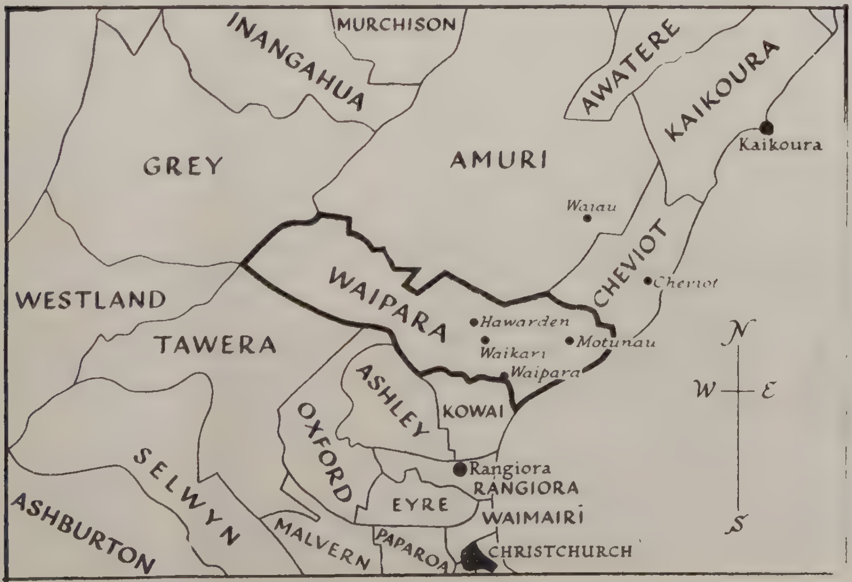


TABLE II—CROPS AND GRASS.

	Acres.
Green fodder (including roots and other crops)	7,851
Grain and pulse crops	16,596
Lucerne cut for hay	2,030
Grasses and clover cut for hay ..	1,089
Grasses and clover cut for seed ..	1,582
Total area of sown grasses	108,458

MOTUNAU PASTORAL FARM.

The grazing run described is in the Motunau district three miles from the sea-coast. It comprises 2,475 acres divided into 16 blocks of warm limestone country with a northerly aspect. Of this area 500 acres are flat, 375 acres are down land, and 1,600 acres are hill country rising to 1,100ft.

In its natural state the hill blocks and some of the downs land carried a good cover of danthonia and poa tussock. Some of the downs land, however, was covered with manuka up to 20ft. in height. The flat area was partly swamp suitable for grazing cattle in dry periods.

Plant and Buildings

The buildings comprise the owner's residence and two cottages for employees, a stable, a small implement shed, and a four-stand shearing shed. An electric motor is used to drive the shearing machines. Farm implements and tractor have been sold as no cultivation work has been carried out for a number of years. The owner intends to purchase a tractor for top-dressing work, however.

Labour

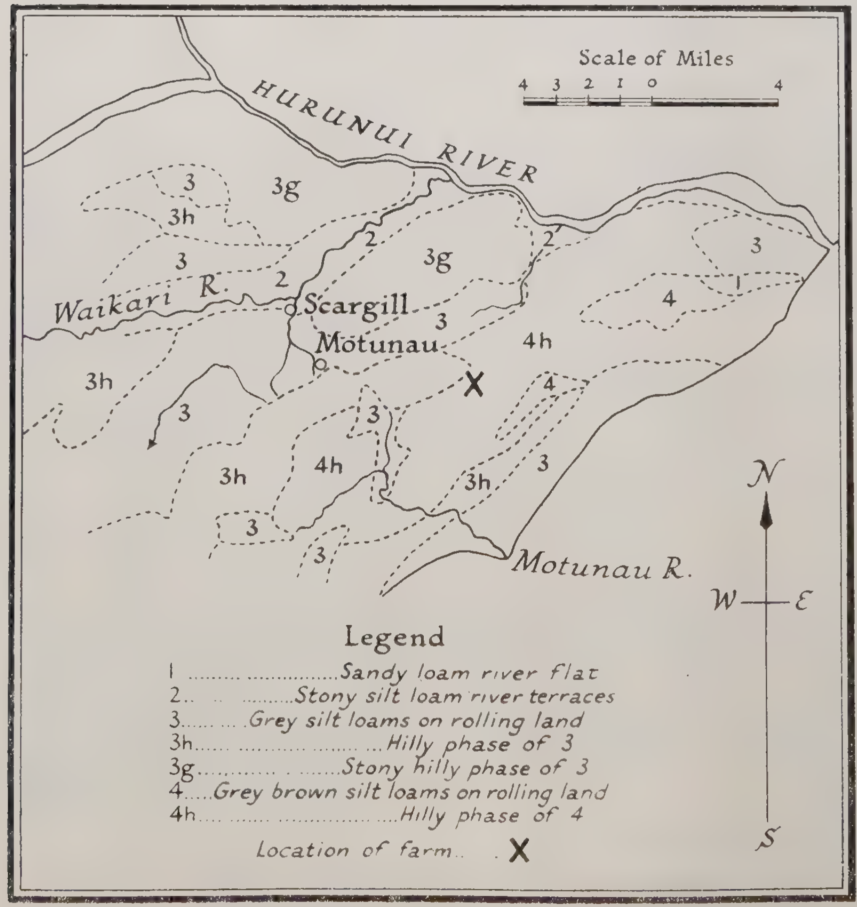
In addition to the owner, two married men are permanently employed on the property. With the exception of shearers no casual labour is employed, although an additional permanent man could be profitably engaged. The owner does his own woolclassing and the permanent men do the crutching.

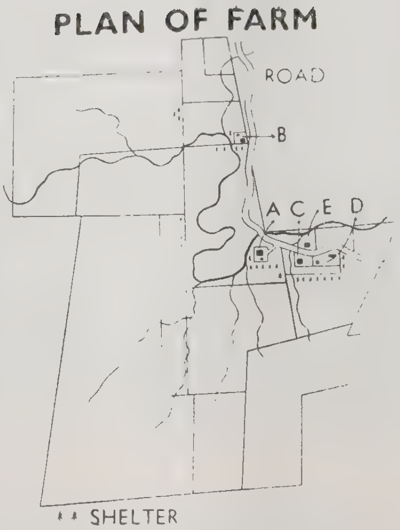
Shelter

Although the country lies well to the sun, shelter belts have been planted in recent years and there is to be further planting. These shelter belts on downs and flats will prove advantageous, particularly during the lambing season.

Water Supply

The property is well watered by permanent creeks and springs.


Scale of Miles
4 3 2 1 0 4
HURUNUI RIVER
Waikari R.
Scargill
Motunau
Motunau R.
3
3g
3h
2
4
4h
1
X
N
W
E
S
Legend
1 ....Sandy loam river flat
2.... Stony silt loam river terraces
3.... Grey silt loams on rolling land
3h.... Hilly phase of 3
3g.... Stony hilly phase of 3
4.... Grey brown silt loams on rolling land
4h.... Hilly phase of 4
Location of farm.. X



A. Homestead. **B.** Cottage, stable, and yards. **C.** Cottage. **D.** Stable, implement shed. **E.** Wool shed, dip, and yards.

Carrying Capacity

Twenty-five years ago 2,200 ewes, 1,000 dry sheep, and 20 Shorthorn breeding cows were carried. At that time all lambs were sold as stores. By 1939 stock had been increased to 2,900 ewe hoggets, 100 wether hoggets, and 250 head of cattle. The stock carrying capacity of the property could have been still further increased, but owing to the curtailment of top-dressing through rationing of fertiliser this was not done. The flock now consists of 2,780 breeding ewes, 1,064 ewe hoggets, 100 wether hoggets, and 120 wethers and rams. The exceptionally good autumn growth has enabled the run-holder to winter 333 head of cattle.

In its natural state the property was unsuitable for the fattening of lambs, and the only returns were from the sale of wool, store sheep, and a small number of fat cattle. Under present improved conditions a large part of the income is derived from the disposal of fat lambs and cattle.

Flock Management

For the past 15 years all ewes have been bred on the property. Some years ago Southdown rams were mated with Corriedale ewes, but although the percentage of fat lambs was better than at present, the disadvantages, particularly with flock replacements, were considerable. Since then the practice has been to use only Romneys and Corriedales. This season Romney rams were put out with 540 Romney ewes, Corriedale rams with 1,000 Corriedale ewes. These, together with 120 stud Corriedales, began lambing at the end of August. The remainder of the flock start to lamb on September 12, docking is done in October and 100 per cent. of lambs is usual. The ram lambs from the stud flock and approximately 1,000 ewe lambs and 120 wether lambs are retained.

Fat lambs are sent to the works off the mothers by the end of January and the remainder are sold as stores by the end of February. The number of fats sold has varied considerably. In 1935 the number sent to the works off the mother was 1,560 (Southdown rams were used at that time); last season only 404 lambs were forwarded as fats. This exceptionally low number is accounted for by sappy grass growth as a result of the unusually wet season.

Each year the flock is culled, all four-year-old ewes are cast for age, and replacements are made from the two-tooths bred on the property. The only other sales of sheep are surplus two-tooth rams and ewes and a few wethers.

All hoggets are drenched with nicotine bluestone in June. The deathrate from various causes is low. For instance, only 2 per cent. of the ewes and 4 per cent. of the hoggets were lost last year.

Because of the size of the blocks the property does not lend itself to any system of rotational grazing. Sheep are seldom shifted from one block to another; the hoggets are carried on the flat paddocks until February, when they are turned out with four-tooth and six-tooth ewes on the down land.

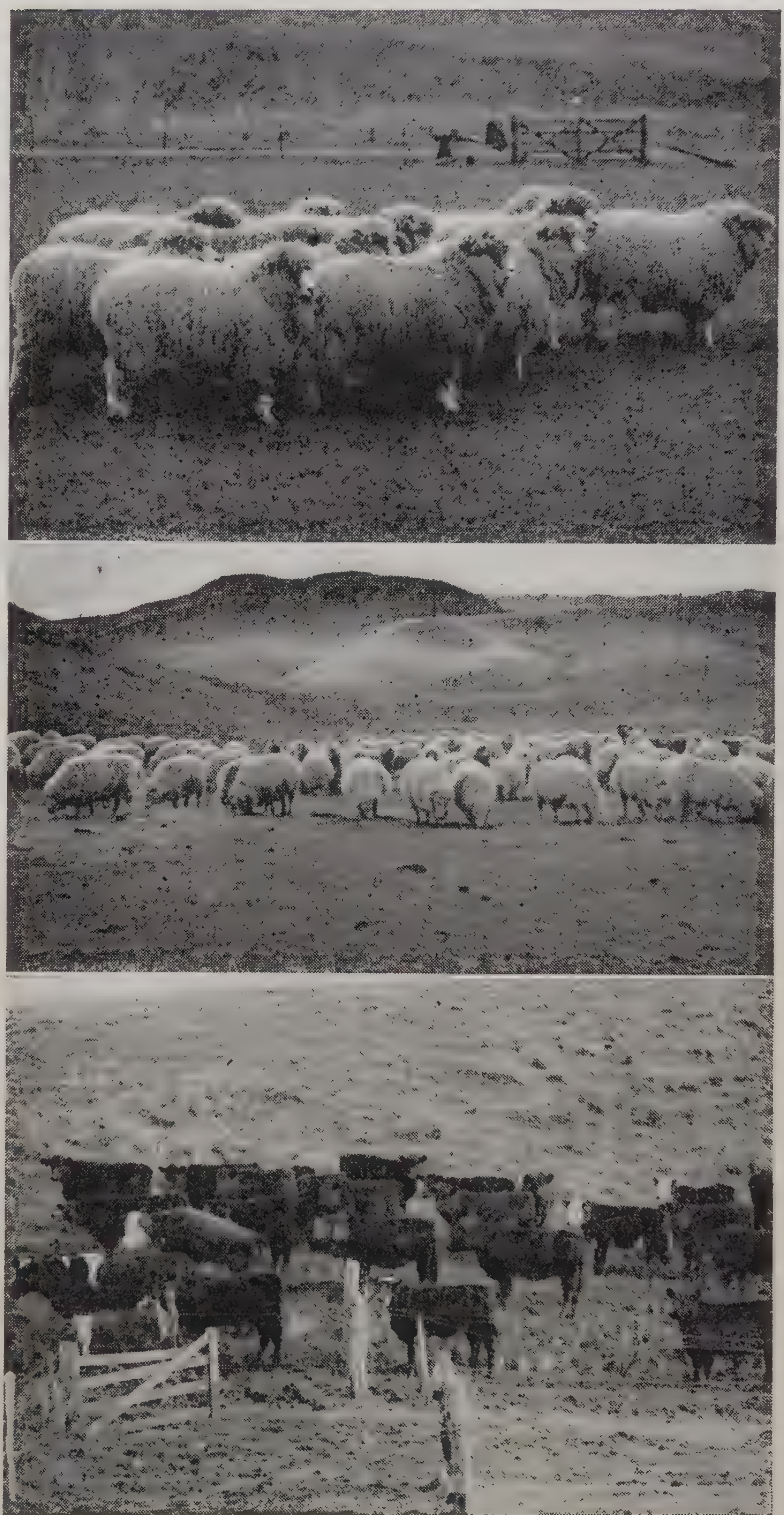
Shearing starts early in November; the weaning and dipping are done in February and the crutching in June. In the 1920-21 season 3,300 sheep were shorn and 75 bales of wool (an average of 7½ to 8lb. per head) were produced. Under present improved conditions the annual clip is 100 bales, an average of 9 to 10lb. of wool per sheep.

Cattle Management

Cattle which are carried primarily to control the pastures for sheep, until 10 years ago were bought and sold according to seasonal conditions. Latterly the practice has been to purchase 120 mixed sex calves each year and to sell older stock as fats. The owner now intends to breed his own cattle and, according to the feed position, either to sell them as stores at 18 months or as beef at 2½ years. With that end in view he now has on the property 130 Black Poll and Black Poll-Hereford cross cows. Bulls are put out on October 15.

In early January castrating and branding take place and last season the percentage of calves branded was 90 per cent. The calves are weaned in May.

LIVESTOCK ON THE FARM



Top—Stud Corriedale ram hoggets. Middle—Romney hoggets. Lower—Calves.

Lime quarry in Motunau district.

The grazing of cattle has proved profitable for, in addition to the returns from sales, the control of roughage has greatly improved grazing conditions for sheep. It is doubtful if the present flock could be carried in such good condition if cattle were not run on the property.

Pasture Improvement

When the present owner bought the property 25 years ago, the flats and some of the downs land had been sown to pasture. Since then a considerable improvement has been effected by the cultivation and sowing down of 900 acres in high-producing strains of grasses and clovers. The manuka was cut and burned, and the land was ploughed in early winter and worked down in the spring. Rape and chou moellier were broadcast together with the following grass and clover mixture:—

	lb.
Perennial ryegrass	20
Cocksfoot	6
Crested dogstail	2
Red clover	2
White clover	1

In addition, on part of this area, 3lb. of subterranean clover were included in the mixture. On the whole area a dressing of 30cwt. of carbonate of lime per acre was applied just before sowing and 2cwt. of superphosphate were broadcast with the seed.

The swamp land was drained by open drains and was later ploughed, cultivated and sown down with the following mixture:—

	lb.
Perennial ryegrass	20
White clover	2
Crested dogstail	2

Five years ago an additional 75 acres of downs land were ploughed and sown in chou moellier and turnips with a mixture of grasses and clovers. Since then no supplementary crops have been grown. Although none of the ground has been ploughed a second time and much of the area has been in grass for 20 years the pastures are still highly satisfactory.

On the hill country a mixture of 8lb. of cocksfoot, 3lb. of perennial ryegrass, and a small quantity of crested dogstail and subterranean clover has been surface sown. On land where vigorous tussock growth gave protection from stock until the young plants had established, cocksfoot has given excellent results. The perennial ryegrass, crested dogstail, and subterranean clover are now important in the sward, and the present appearance of this area shows the value of surface sowing on this type of country.

Topdressing

Before the rationing of fertiliser approximately 900 acres of grassland were topdressed each year with 1cwt. of superphosphate per acre. Although outcrops of limestone occur on parts of the property, up to 400 tons of carbonate of lime have been used annually with beneficial results. Pastures are not producing their maximum at the present time due to lack of fertiliser. In future the owner intends to use 500 tons of carbonate of lime annually and not less than 60 tons of superphosphate when fertilisers are again available.

Rabbits

Rabbits were not a serious pest when the property was bought 25 years ago, but they multiplied so rapidly that within five years the stock-carrying capacity was seriously affected.

This menace was not overcome until a rabbit-proof fence was erected and a definite programme of poisoning was carried out. Rabbit traps were not used because of the possibility of destroying the natural enemies; the use of strychnine poison with carrots has proved so effective that rabbits are now seldom seen.

Conclusion

This property could not be classed a typical North Canterbury grazing run because of the expensive improvements which have been initiated and maintained. Points particularly noteworthy on this farm are: (a) The initial clearing, draining, ploughing, and sowing down to pasture of all available land; (b) the maintenance as far as possible of these pastures by topdressing and liming; (c) the surface sowing of the tussock hill country with suitable grasses and clovers; (d) the running of a relatively large proportion of cattle—one cattle beast to 10 acres. As a result of this progressive policy, which has proved both interesting and profitable, the flat paddocks can now carry approximately three ewes per acre, the downs land two ewes per acre, and the hill country one ewe per acre, in addition to the cattle normally carried on the run.

Acknowledgements

Thanks are expressed to the Soil Survey Division of the Department of Scientific and Industrial Research for data in the soil map and to the Lands and Survey Department for the drawing of maps.

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Hop Culture in Nelson District

THAT early settlers in New Zealand experienced in hop growing should have selected as their home a part of the country—perhaps the only part—peculiarly suited for the production of hops was a fortuitous circumstance responsible for the early establishment of an industry which has continued to thrive in the favoured Nelson district. In this article N. J. Adamson, District Supervisor, Horticulture Division, Nelson, reviews the growth of the industry and the accepted cultural and management practices in New Zealand.

COMMERCIAL hop culture in New Zealand is an industry peculiar to the Nelson district, where conditions of soil and climate have proved most suitable for the production of high-grade hops. Climate is probably the more important factor, the requirements being an adequate rainfall of 30 to 40in. per annum, with relatively high summer temperatures and hot dry conditions for harvesting. Absence of high winds is also important, as the vines are grown on an overhead wire trellis system to which they are trained. Frequent high winds would prove too damaging for successful hop production. The soils which have been selected for hops are deep alluvial ones rich in plant food, and as a rule well supplied with organic matter. Best results are usually secured on very friable soils of a light, loamy texture and of good depth. Good natural drainage is a most important factor, as the hop vine is a gross feeder, its roots reaching down to a good depth as well as spreading outwards. Any restriction in root development through a high water-table would restrict growth and cause loss of plants through root rot.

The root of the commercially-cultivated hop (*Humulus lupulus*) is perennial and sends out each year several herbaceous rough twining stems. The fruit or strobile for which the vine is so extensively cultivated is a sort of cone composed of membraneous scales, each of which envelops a single seed, and the whole is covered when mature with a fair amount of a yellow resinous substance or lupulin, which gives the mature hop a sticky feeling. It is the extent to which this resinous material is developed which gives quality to the product through its aroma.

Introduction to N.Z.

Hop plants were introduced from Kent, England, by the early settlers, and it has possibly been a matter of fortunate coincidence that some of these earliest settlers from England with experience in hop growing should have settled in a district where conditions were so favourable for the cultivation of hops, conditions which in all

★

ALTHOUGH an export demand has been responsible for a slight increase in the area planted in hops, the annual acreage stands at about 650 acres, mainly centred round Motueka in the Nelson district. The average annual yield is about 3,500 bales (9,375cwt.). A large recruitment of seasonal casual labour is necessary for the short harvest period in early autumn, but the management and maintenance of gardens during the rest of the year provide a livelihood for many, and the industry is of no small economic importance.

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Left:
Hop vine ready for harvesting.

Below:
Hop kilns at Motueka.

probability could not be equalled in any other part of New Zealand. Hops were cultivated in Nelson as early as 1842, gardens actually located within the present Nelson City boundaries being a feature of the area now known as "The Wood," and for a short distance up the Maitai Valley. As the city grew, hop garden areas were required for residential sites, and the industry was gradually transferred to outlying districts. In the Motueka area, which has remained the centre of hop growing, commercial planting was commenced about 1870 and increased considerably by 1880. Hop gardens are located principally in Motueka and Riwaka, with other gardens located in the Waimea, Moutere, and Tadmor areas.

Varieties Grown

One of the earliest introductions was known as Bumford and came from Kent. This variety was grown for a number of years, but has almost disappeared. Other varieties have been cultivated and are included under the local names of Green Vine and Brown Vine, which are composite groups of varieties. A few acres of Green Vine have remained until fairly recently, but for a number of years the bulk of the production has been from a variety introduced from the United States and known locally as Californian or Nelson Californian. This variety was introduced over 50 years ago and since its introduction has become acclimatised and has changed its characteristics, probably due to environment. In any case it has developed into a type most suitable for local conditions and is characterised by its prolific habits and its full aroma.

Selection and Planting

Hop plants are normally spaced 6ft. 6in. apart each way. Plants are procured by taking cuttings or "sets" from selected established vines, planting three close together in a cluster. These develop into a solid crown, from which the new shoots arise each year to form the vines. Two types of sets known as "crown" sets and "sucker" sets are used, and it is usual to use crown and sucker sets in the proportion of two to one. The crown sets are more sappy and are cut direct from the crown and consist of the few inches of the base of last season's vines which have been earthed up. The sucker sets consist of portions of underground runners which are cut into short lengths with two or three eyes and sometimes are equipped with rootlets.

Sets are planted so that the top is level with the surface and then covered with about 2in. of loose soil. The crowns with their immediate location are known as "hills." Thus it is usual to refer to the number of hills to a given area rather than the number of vines. For normal planting just over 1,000 hills go to an acre. Late planting is advised, the best time being in the first week of October.

Soil Preparation

In establishing a new garden too much care cannot be given in preparation of the land for reception of sets, as it must be remembered that a hop garden is something of a permanent nature and represents a fairly heavy capital outlay.

Thorough, deep cultivation, attention to drainage, and the eradication of persistent weeds such as twitch and convolvulus are important. The initial ploughing should be carried out early to secure the benefits of winter rains and frosts to mellow the soil and reduce it to a friable state. In the spring a thorough discing and cultivation are required to bring the land into a good tilth to facilitate planting and subsequent inter-row cultivation. A dressing of 1 ton of ground limestone per acre should be applied after the initial ploughing.

Erection of Trellis

Although at one time hops in Nelson were trained on long manuka poles, this system has been almost entirely replaced by an overhead wire trellis system. Strings are tied to the overhead wires, let down to the base of the plant, and fastened to a wire pin pushed into the ground under the roots to serve as a support to the vines. As newly-planted gardens are capable of producing a light crop in the first year—up to 1,000lb.—it is necessary to erect the permanent wire trellis in the first year of establishment. Heavy posts of bluegum or black birch, usually 4 to 6in. in diameter, are used to carry the trellis; those on the outside of the area are 18ft. long, and inside posts 17ft. long. Outside posts should stand outwards at an angle of 30 degrees from the perpendicular and be set in the ground 3ft., while inside posts are sunk to a depth of 2ft. 6in. All outside posts require to be well anchored. For this purpose opposite each, at a distance of 20ft., anchors 6in. by 6in. and 4ft. long are buried 4ft. in the ground. Posts are spaced 32½ft. by 26ft. for a planting distance of 6ft. 6in. between hills, thus providing for a row of posts in every fifth row in one direction and a post at every fourth row across. Supporting wires for vines, which usually run north and south, are so spaced as to have one over each row of hills. The supporting wires are single strands of No. 8 gauge plain fencing wire, and cross at right angles main carrier wires, which are placed at every fifth row and run east and west. Carrier wires are much heavier, as they must carry a good weight, and usually consist of three strands of No. 8 plain fencing wire twisted into a single cable stretched tightly over the top of a row of posts to which they are fastened. Supporting wires cross the carriers at right angles and at every fourth wire there is a row of poles (see diagram). In making the trellis care should be exercised to leave no weak spots, for if one post should break or give way the whole field is likely to come down through uneven strain.

Tying the Vines

In training and tying the vines four or six of the most thrifty in each hill are selected and the rest cut off. Two strings are taken from each hill and two or three vines are trained around each. When the strings are in place and vines are about 2ft. long they are wound round the strings, always in the one direction, that is clockwise, after which they will take care of themselves. The two strings leading from each plant are spaced about 3ft. apart on the overhead wire, 14 to 15ft. above ground. Putting up double

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TIME SAVED EQUALS EXTRA WAGONS

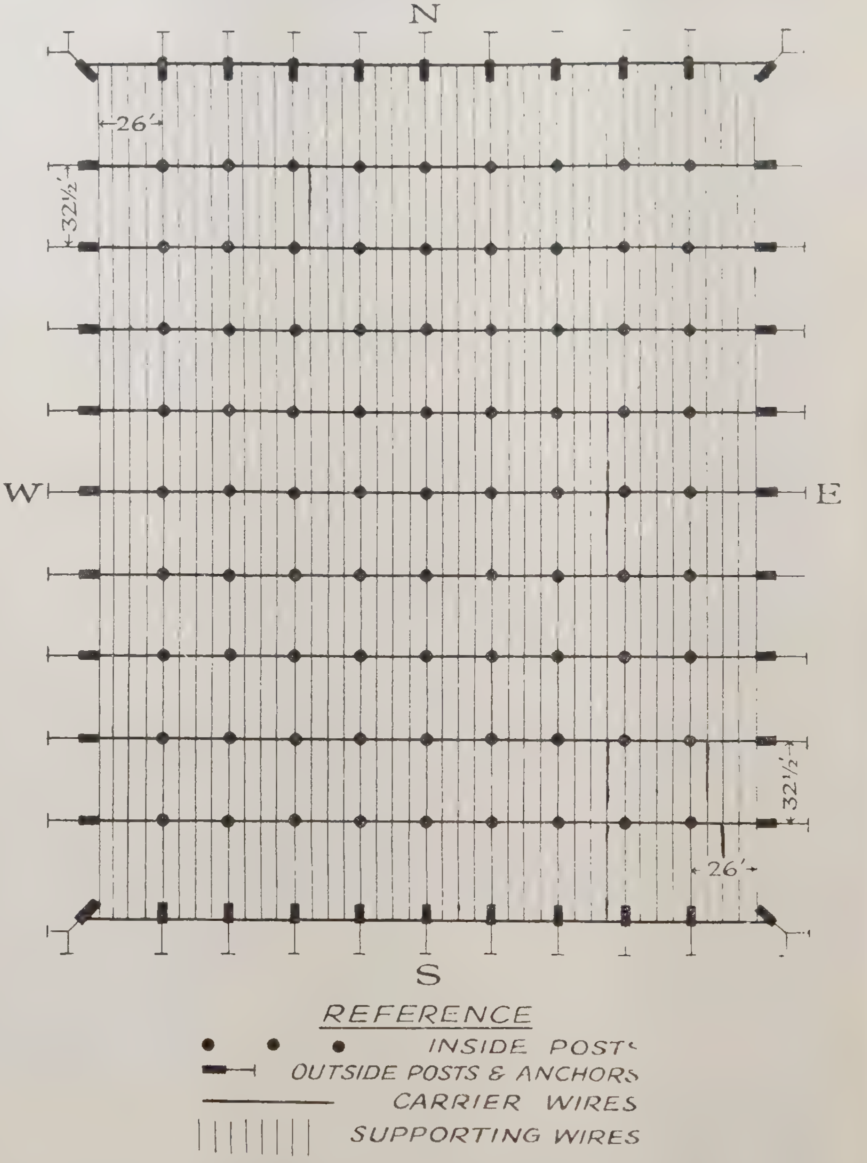
strings for so many hills to an acre might appear to be a formidable task, but through the employment of a simple device an experienced man is able to accomplish the job quickly and without the use of ladders. A ball of hop or binder twine is carried in a small bag swung over the shoulders. A metal ring about 8in. in diameter is used to which the end of the twine is attached either by tying or by a patent quick-release clip. The ring with string attached is tossed over the wire, a slip knot is quickly made and a tug runs this up to the wire. The string is then cut off at the necessary length and the end fastened to the wire pin which has been pushed into the ground under the root of the plant.

Treatment of Hills

Immediately following the harvesting gardens are cleaned up by gathering strings and vines and burning on the garden site. Several furrows are ploughed on to each side of the hills about June or July. About mid-September the garden is again ploughed, but this time it is ploughed "off," leaving a narrow strip down each row. It is while the garden is in this condition that hills are opened up for pruning and taking new sets. The soil is dragged away from the crowns by means of a drag hoe. While the crowns are exposed suckers are hoed or pruned off and sets formed from last season's growth are removed, leaving the main crown intact and confined within certain limits, usually about 10in. in diameter.

Following the second ploughing soil should be in a condition which will permit of it being brought into good tilth quite readily by the use of the cultivator. Frequent cultivation should be maintained up to early January for the purpose of conserving moisture and controlling weed growth to secure the maximum development in the vines. After that date it is necessary to discontinue cultivation except for a light harrowing, as damage to the fibrous roots which begin to crowd the top soil will at this stage effect the crop.

DIAGRAM SHOWING ARRANGEMENT OF POSTS & WIRES FOR A HOP GARDEN OF APPROXIMATELY 2 ACRES



Manuring

Hop plants are gross feeders and require liberal manuring to get the maximum results, and as a relatively high monetary return may be obtained per acre, rather heavy and expensive fertiliser applications will prove profitable. A hop garden is a permanent establishment and plants may be growing on the same site for a very long period. To maintain production at a high level the fertility of the soil must be maintained by regular annual applications of suitable fertilisers as well as soil improvement by ploughing in green crops and by liming.

The question of the possible life of a garden sometimes arises. It is known that some gardens are up to 60 years old, but during this long period all the original plants have possibly been replaced once or perhaps twice. A number of gardens 30 years old are reported to contain some of the original plants.

Fertilisers applied to hop gardens usually consist of a special hop mixture composed of superphosphate, potash, dried blood, and sulphate of ammonia used at the rate of up to 10cwt. per acre and applied broadcast in the spring and worked in by cultivation.

For general use in the Nelson district a mixture of the following ingredients is suitable:—

Superphosphate	5 to	6cwt.
Muriate of potash ..	1½ "	2 "
Dried blood		1½ "
Sulphate of ammonia ..		1½ "
	9½ to	11cwt.

For most gardens up to 10cwt. of this mixture per acre might be profitably used for manuring of hops. Replacement of some of the superphosphate by bonedust would probably keep the mixture freer for drilling. Under certain circumstances an additional dressing of nitrate of soda or sulphate of ammonia at the rate of 1cwt. per acre may be required in early December to stimulate growth. With the exception of selected hop gardens in the Riwaka area, all soils used for hop growing in the Nelson district require lime treatment. An application of ¾ ton per acre of ground limestone every two years is desirable. Lime should be applied after the spring ploughing and worked into the soil.

For soil improvement and maintenance of organic matter in hop soils green crops are grown, and for this purpose blue lupins are sometimes sown towards the end of January and turned in towards the end of July. Successful green crops are also obtainable from oats and rye corn sown in early autumn for turning in during the late winter.

Harvesting and Curing

Quality in hops is largely influenced by the time of picking and in the curing, which is a process in kiln drying. Experience and judgment are required in turning out a good grade product. The virtue of the hop resides in the lupulin which covers the strobile; therefore the strobile or fruit of the hop should be gathered when in the best condition to give when cured the highest percentage of lupulin, which may range between 6 and 12 per cent. by weight.

There are several means of deciding when hops are sufficiently mature for picking. One generally used is by colour and feel. Change of colour of the strobile to a bright yellowish-green and a crisp feeling is an indication of maturity. The hops then produce a rustling sound when handled.

The harvesting season comes in March and lasts only 4 weeks in most seasons. It is necessary to complete the harvesting before the hops are too mature, otherwise waste occurs and hops suffer in grade. Sufficient pickers are employed in a garden to give two fillings to a kiln each day. With two fillings a day the standard-sized kiln will provide for 6 to 8 acres according to yield.

At picking time the side of the garden showing the most maturity is chosen for a starting point and the garden is then worked through systematically. Bins made of sacking and light wooden frames of 25 to 30 bushels capacity for picking into are brought into the garden; the vines are cut off about 2ft. from the ground and at the top by means of a long-handled sickle and placed across the end of the bin by the operator. One such operator known as the "stringer" will keep about 20 average pickers supplied. A team of this size will provide sufficient hops to maintain a kiln at full capacity. Picking is done on a price-per-bushel basis. Experienced pickers will average about 40 bushels per day. The strobiles are plucked off by hand, and clean picking is required so that leaves and other rubbish are excluded. Twice a day the picked hops are measured from the bins into large bags or pokes of a capacity of 10 to 12 bushels, in which they are conveyed to the kilns for drying. Measuring is done by scooping up the hops into a bushel measure which is topped off loosely. A bushel of green hops weights about 7lb. and will produce about 1lb. of dried hops.

Curing, which is proceeded with as the hops are harvested, is simply a process of drying which is carried out in specially-constructed kilns, which usually conform to a standard size and design, being 16ft. square and 16ft. to the eaves, the roof coming to an apex surmounted by a cupola. These kilns are familiar sights in the hop-growing areas, their main features being a furnace room 16ft. x 16ft. and 12ft. to the drying floor above. The furnace room contains an open coke furnace supplying direct heat to a drying floor above, where the green hops are spread out for drying. The drying floor has an open-mesh horse-hair matting, covering battens spaced about 2in. apart. The design of kilns ensures a good draught and free circulation of hot air, which is drawn up from the furnace through the drying floor and hops at a maximum temperature of 140°F. The temperature is allowed to drop before finishing so that hops will have cooled before removal from the kiln, as they damage less in handling when cool, being less brittle than when immediately the drying is finished.

A kiln is normally loaded to a depth of 18 to 20in. or about 300 to 350 bushels for one drying. Care is taken that the temperature is not high enough to scorch the hops, the object being to dry them sufficiently to prevent mildew, while retaining the natural oils which give the hop its quality. At intervals of about 2 hours it is necessary for the drier to attend to the fires, and usually after about 8 hours the hops require turning with a large wooden malt shovel to ensure even drying. After they have been allowed to cool the hops are removed from the kiln to a cooling floor in an adjoining room, where they remain until it is convenient to bale and press. The whole drying process takes about 12 hours in the earlier part of the season, and later only 7 to 8, so that it is possible to put through two loadings per kiln per day. It is usual to have all hops picked up till mid-day loaded immediately and the afternoon picking at midnight. In starting a new season it is necessary to fire the kiln for 5 to 6 hours before the first loading to expel all dampness, as steam will damage hops. Subsequent loadings are into an already-heated kiln. Coke is the fuel used in the furnaces, and to avoid any smoke,

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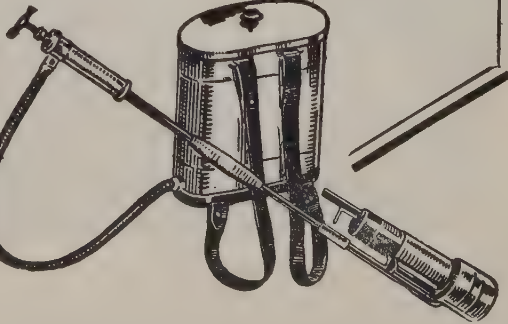
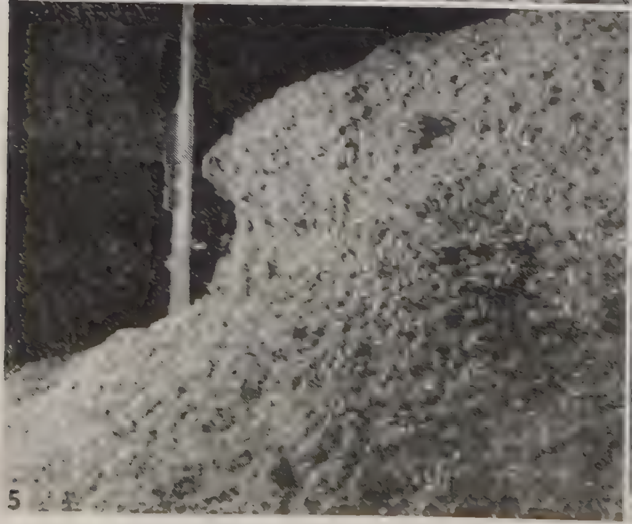


HARVESTING AND CURING OPERATIONS



1. A picking bin. 2. Binful of hops. 3. Measuring. 4. A loaded kiln. 5. A bulk of dried hops. 6. Baled hops.

which would ruin the hops, the fire is started with charcoal sprinkled with kerosene.

Baling

Hops are packed into bales of about 300lb. weight. Baling is carried out by the growers, who use hand-operated presses after the design of a wool press. For convenience in handling and baling the cooling floor where the dried hops are also bulked is on a level a few feet lower than the drying floor of the kiln, and filling into the packs is done through an opening in the floor above which the press is housed. Baled hops are removed from the growers' storage to the brokers' bulk store in Nelson, where they are graded on samples extracted from the bales. Before consigning to their ultimate destination bales are "dumped," two bales being pressed together into half their original size and then wire strapped.

Diseases of Hops

The only disease of commercial significance affecting hops in the Nelson district is black rot caused by the fungus *Gibberella cyanogena (Desm) Sacc*, which causes rather a severe loss in plants each year and reduces yield in affected plants. Seasonal conditions govern the intensity of the disease, loss of plants being more severe following a wet spring, when many plants may succumb towards the end of the season. New sets planted in ground from which infected plants have been removed may become infected during their first season and die. The root system and crown are the parts mainly infected, although the fungus may penetrate to the base of the vine. The actual death of the plant is brought about by the fungus penetrating the water-conducting tissue that runs up the central region of the root, crown, and vine, and so prevents ascent of sap to the parts above. The disease as a rule is contracted from the soil through a wound on an underground part of the plant. Cuts made in pruning the crown and damage to roots during cultivation provide points of entry. In wet weather growth of the fungus within the root is rapid. The variety known as Californian is highly susceptible, and as this is the variety almost exclusively grown, any measures which may be applied for minimising infection should be adopted.

Control Measures

As the fungus remains alive in dead tissue for some time, it is important that no diseased or dead portions remain in the ground over the winter. Care is required in dealing with diseased plants to remove all the underground portion of the plant from the hill and its vicinity, as infected or dead roots can extend a considerable distance. This material should be destroyed by burning as soon as possible.

If on being pruned a crown shows the characteristic dark brown or black discoloration associated with the disease, the plant should be removed and the knife sterilised by dipping in formalin solution (1-320) before using it on the next hill.

Fibrous runner sets or sucker sets are less liable to contract infection than sappy sets taken from the crown or crown sets.

Early planting in contaminated soil is dangerous, as cold night temperatures of early spring do not permit of rapid and uninterrupted growth necessary for the callusing of the cut end, which in consequence remains exposed to infection. At the same time the heavy rainfall usually experienced in spring favours rapid growth of the fungus.

The use of sucker sets and delay in planting as long as possible are the two chief means of avoiding infection in new sets. By leaving hills open as long as possible after pruning in the spring the cut crown is exposed to the drying action of the sun and a protective covering develops over the crown, which is likely to prove an advantage in protecting the plant.

All measures possible to minimise black rot in hops should be adopted as a means of preserving existing gardens and maintaining production at an economic level.

References: Cawthron Institute Bulletins, "Black Rot of Hops" and "The Manuring of Hops."

◆

Radio Broadcasts

RADIO talks to farmers will be given from Station 1YA, Auckland, at 7.15 p.m. on the following dates:—

March 18—"The Value of the Fields Division to the Farmer," by Mr. J. M. Smith, Director of the Fields Division, Department of Agriculture, Wellington.

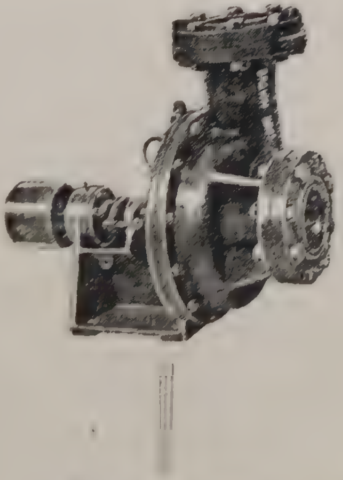
March 25—"Young Farmers' Clubs Session," by Mr. F. S. Atchison, Dominion President of the Young Farmers' Clubs Federation.

◆

PASSION FRUIT CULTURE.

There is a profitable market in the Dominion for passion fruit, but in recent years the passion fruit industry has been on the decline, largely due to havoc wrought by diseases. Bulletin 135, "Passion Fruit Culture," contains information on the recognising and the treating of the various diseases as well as valuable advice on the general culture of the vines. This bulletin is available free from offices of the Department of Agriculture.

◆



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Sure-Grip OPEN CENTRE TRACTOR TYRES

Lambing Estimates For 1945

A NEW ZEALAND RECORD

Number Tailed Should Exceed 20 Million

Contributed by the LIVESTOCK DIVISION.

THE highest lambing percentage estimate ever recorded in New Zealand—92.64—has been made for 1945.

While the percentage estimate for the South Island was, as usual, higher than for the North Island, the difference was only .19 per cent. compared with a difference of 3.99 per cent. the previous season.

From the estimated number of lambs in the Dominion in 1945 measured by totals in other years, it is reasonable to assume that for the first time in the history of New Zealand farming the number of lambs tailed in any one year will have exceeded 20 million.

County.	Breeding Ewes.	Estimated Percentage of Lambs.	Estimated Number of Lambs.
AUCKLAND DISTRICT.			
Mangonui	33,967	87.08	29,578
Whangaroa	14,386	88.35	12,710
Bay of Islands	61,325	92.36	56,640
Hokianga	54,339	85.80	46,623
Whangarei	93,494	87.40	81,714
Otamatea	78,379	91.9	72,030
Hobson	76,598	94.68	72,522
Rodney	93,815	83.88	78,692
Great Barrier	7,209	69.96	5,043
Waitemata	78,365	91.08	71,374
Eden	2,653	96.74	2,566
Manukau	65,035	86.54	56,281
Franklin	106,839	101.9	108,869
Coromandel	36,790	74.22	27,306
Thames	8,926	73.81	6,588
Hauraki Plains	13,785	96.01	13,235
Ohinemuri	13,185	93.51	12,329
Waikato	165,985	99.18	164,623
Raglan	398,719	91.35	364,229
Waipa	190,160	96.91	184,284
Piako	142,649	102.77	146,600
Matamata	255,373	104.63	267,197
Rotorua	88,921	100.47	89,339
Taupo	23,903	90.83	21,711
Taumarunui	101,932	93.0	94,797
Kawhia	66,326	92.20	61,153
Otorohanga	140,743	96.0	135,113
Waitomo	350,741	88.28	309,634
Ohura	106,446	94.0	100,059
Kaitieke	66,860	97.0	64,854
Tauranga	132,850	96.0	127,536
Whakatane	45,480	88.6	40,295
Opotiki	53,190	79.2	42,126
Totals	3,169,368	93.64	2,967,650

County.	Breeding Ewes.	Estimated Percentage of Lambs.	Estimated Number of Lambs.
EAST COAST-HAWKE'S BAY DISTRICT.			
Matakaoa	59,868	79.08	47,344
Waiapu	237,452	80.43	190,983
Uawa	121,671	83.67	101,802
Cook	435,451	89.63	390,295
Waikohu	345,761	86.62	299,498
Wairoa	399,084	80.78	322,380
Hawke's Bay	952,325	87.02	828,713
Waipawa	420,488	97.29	409,093
Waipukurau	142,112	96.02	136,456
Patangata	480,483	88.07	423,161
Weber	51,399	95.0	48,829
Dannevirke	287,670	100.0	287,670
Woodville	86,411	100.0	86,411
Pahiatua	157,462	93.0	146,440
Akitio	152,251	87.0	132,458
Totals	4,329,888	88.95	3,851,533
WEST COAST-WELLINGTON DISTRICT.			
Clifton	89,417	97.14	86,860
Taranaki	25,977	97.17	25,242
Inglewood	50,084	91.68	45,917
Egmont	18,881	97.49	18,407
Stratford	97,917	86.0	84,209
Whangamomona	49,428	86.0	42,508
Eltham	54,354	95.97	52,164
Hawera	78,954	100.68	79,491
Waimate West	5,083	103.84	5,278
Patea	208,169	101.8	211,916
Waitotara	135,206	93.5	126,418
Waimarino	178,036	87.0	154,891
Wanganui	267,482	87.8	234,849
Rangitikei	975,827	99.0	966,069
Oroua	211,512	102.68	217,181
Kairanga	121,811	101.5	123,638
Kiwitea	241,917	103.49	250,360
Pohangina	125,876	101.55	127,827
Manawatu	143,149	107.6	154,028
Horowhenua	124,340	95.8	119,118
Hutt	68,019	81.42	55,381
Makara	48,538	84.48	41.005
Featherston	327,719	93.0	304,779
Wairarapa South	166,839	99.9	166,672
Masterton	290,845	85.0	247,218
Castlepoint	93,715	86.5	81,063
Eketahuna	145,215	86.5	125,611
Mauriceville	46,445	81.0	37,620
Totals	4,390,755	95.33	4,185,720

County.	Breeding Ewes.	Estimated Percentage of Lambs.	Estimated Number of Lambs.
MARLBOROUGH-NELSON-WESTLAND DISTRICT.			
Waimea	169,365	84.0	142,267
Takaka	28,995	89.0	25,806
Collingwood	15,155	82.0	12,427
Buller	1,872	86.28	1,615
Inangahua	14,631	99.03	14,489
Murchison	30,234	87.28	26,388
Grey	23.439	107.67	25,237
Westland	34.819	107.44	37,410
Sounds	97,437	78.18	76,176
Marlborough	197,225	82.75	163,204
Awatere	162,453	87.94	142,861
Totals	775.625	86.11	667,880
CANTERBURY-KAIKOURA DISTRICT.			
Kaikoura	134,971	78.0	105.277
Amuri	223,986	72.0	161.270
Cheviot	141,594	89.0	126,019
Waipara	279,595	88.0	246,044
Ashley	61,328	75.0	45,996
Kowai	70,517	101.0	71,222
Oxford	71.164	66.9	47,609
Rangiora	35,945	97.69	35,115
Eyre	51,348	95.0	48,781
Tawera	50,913	67.0	34,112
Malvern	124,746	96.36	120,205
Paparua	36,949	101.33	37,440
Waimairi	3,118	100.11	3.121
Heathcote	6,898	77.0	5,311
Akaroa	81.501	107.0	87,206
Mt. Herbert	40,670	105.0	42,704
Wairewa	71.295	103.0	73,434
Halswell	15 045	83.0	12,487
Springs	29 574	110.0	32,531
Ellesmere	75.291	98.0	73,785
Selwyn	146.498	75.1	110,020
Ashburton	701,127	90.4	633,819
Geraldine	224.050	83.5	187,082
Levels	153,500	98.42	151.075
Mackenzie	282.967	80.0	226,374
Waimate	435.223	95.25	414,550
Chatham Islands	40,818	73.0	29,797
Totals	3,590,631	88.07	3,162,386
OTAGO-SOUTHLAND DISTRICT.			
Waitaki	450,420	88.0	396,370
Maniototo	245.944	90.1	221,596
Vincent	258,950	89.0	230,466
Waihemo	100.294	80.0	80,235
Waikouaiti	70,508	93.0	65,572
Taieri	165 556	79.0	130,789
Peninsula	17,019	107.0	18,210
Clutha	407 836	101.1	412,322
Tuapeka	329 615	95.2	313,793
Bruce	211.731	97.1	205,591
Lake	126,686	75.1	95,141
Southland	1.664.058	109.0	1,813,823
Wallace	558.896	91.1	509,154
Stewart Island	2,078	80.0	1,662
Totals	4.609.591	97.51	4,494,724

DISTRICT ESTIMATES.

The following table gives the estimates for the current (1945) season's lambing for the several sheep districts:—

District.	Number of Breeding Ewes.	Estimated Percentage of Lambs.	Estimated Number of Lambs.
Auckland	3,169,368	93.64	2,967,650
East Coast-Hawke's Bay	4,329,888	88.95	3,851,533
West Coast-Wellington	4,390,755	95.33	4,185,720
Marlborough-Nelson-Westland	775,625	86.11	667,880
Canterbury-Kaikoura	3,590,631	88.07	3,162,386
Otago-Southland	4,609,591	97.51	4,494,724
Dominion	20,865,858	92.64	19,329,893

Dominion Totals

The following table shows the estimated lambing for the North and South Islands for the previous five years, together with the actual number of lambs tailed:—

Year.	Number of Breeding Ewes *(as at 1941).	Estimated Percentage of Lambs.	Estimated Number of Lambs.	Actual No. of Lambs Tailed
NORTH ISLAND.				
1945	11,890,011	92.56	11,004,903	—
1944	11,740,920	90.08	10,576,495	11,054,223
1943	*11,268,384	87.18	9,823,748	10,654,244
1942	*11,268,384	89.95	10,134,505	10,801,599
1941	*11,268,384	90.74	10.224,786	10,568,215
1940	10,917,684	89.01	9,717,488	10,348,649
SOUTH ISLAND.				
1945	8,975,847	92.75	8,324,990	—
1944	8,808,796	94.07	8.286,568	8,399,083
1943	*8,762,549	89.16	7,813,548	7,767,692
1942	*8,762,549	93.34	8,179,674	8,063,293
1941	*8,762,549	91.60	8.026.076	7,955,075
1940	8.809,973	91.69	8,078.518	8,037,123
DOMINION.				
1945	20,865,858	92.64	19.329.893	—
1944	20,549,716	91.79	18,863,063	19,453,306
1943	*20.030,933	88.05	17,637,296	18.421,936
1942	*20,030,933	91.43	18,314,179	18,864,892
1941	*20,030,933	91.11	18,250,862	18,523,290
1940	19,727,657	90.21	17.796,006	18,385,772

FINAL WOOL ESTIMATE

An all-time record weight of 372 million pounds is revealed in the final estimate of wool production for the 1944-45 season in New Zealand. This total is 27 million pounds more than the previous record figure reached in the 1941-42 season, and 42 million pounds more than the 1943-44 total. Average seasonal production during the three immediate pre-war years was 309 million pounds.

SHEARING AND TAILING

In the 1944-45 season more sheep and lambs were shorn and more lambs were tailed than ever before in New Zealand. The latest figures, with the figures for the immediate pre-war year, 1939, in parentheses, are as follows: Sheep shorn, 30,285,000 (29,042,000); lambs shorn, 5,245,000 (4,119,000); lambs tailed, 19,453,000 (17,230,000).

Chilled Beef

Production of Cattle in Waikato and Waipa

FULLY four years before the outbreak of war farmers of the Waikato began to take a keen interest in the production of chilled beef for export. At the beginning of the war, however, farmers were called upon to produce as much beef as possible, and chilled beef production was suspended in the meantime, but it is anticipated that with the end of the war the demand will again come for a light beef carcass, and it is natural to assume that interest in chilled beef production will be revived.

IN view of this probable resumption of production for the chilled beef trade, the following report by T. E. Rodda, Fields Instructor, Hamilton, on investigations conducted at Ruakura Farm when it was functioning as a Farm of Instruction may prove of interest.

Waikato Production

Before 1935 very little chilled beef was produced in the Waikato. What was produced was mostly from young cattle raised on the hill-country runs of the East Coast and other districts. These cattle upon arrival in the Waikato were mostly grazed in conjunction with sheep, principally on the fat lamb producing farms. Very few graziers had established herds of recognised beef breeds to breed and raise cattle expressly for the trade. Very few farmers knew definitely what was required and what really constituted a first-class chilling animal, and no one was in a position to offer really sound advice. It was found, however, that given a reasonable chance the animals did well and put on flesh very quickly on topdressed country. Farmers who had commenced breeding found that second- and third-calver cows calving in early spring were subject to grass staggers similar to the milker herds. Men who had such troubles and numerous losses became disheartened and ceased breeding on that account. Another objection raised to Polled Angus cattle especially was the low percentage of calves. It was contended that high feeding and insufficient exercise induced sterility.

Up to that time no investigation into chilled beef production had been attempted at Ruakura Farm. During June, 1936, a number of run steers were purchased and allowed to follow the sheep and dairy herds to suppress rough grass. It was quickly apparent that the animals were making really good progress, and it was considered desirable to correlate information on their body weight increases, growth measurements, etc. With this end in view a weighbridge was erected and authority obtained for the purchase of 100 Polled Angus and Polled Angus X Hereford heifers from a station in the Gisborne district in February, 1936. Two Polled Angus bulls were purchased and the heifers mated so as to calve in the following December and January. The object of this late calving was to ascertain if calves produced at this period of the year, suckled by the dams during the first winter, and weaned at the end of August would be heavy enough for chillers by the end of the autumn or early winter when 17 or 18 months old, thus obviating the necessity of carrying them over the second winter. The results of this preliminary line of investigation will be given later on in this article.

Ruakura Trials

During June, 1937, trials were initiated to investigate the following points:—

1. The methods of management that are most suitable for chilled beef production on Waikato farms, especially fat lamb producing farms.
2. The seasonal variation in the rate of growth and the extent to which supplementary feeding is necessary and profitable.

1. Methods of Management—Trial No. 1.

For a preliminary trial to test out

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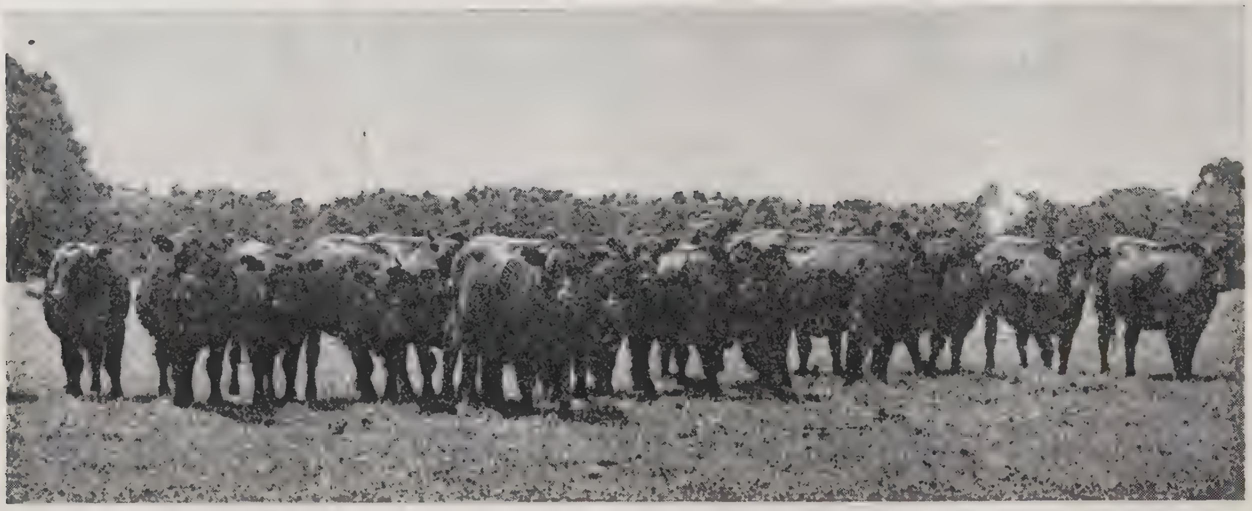
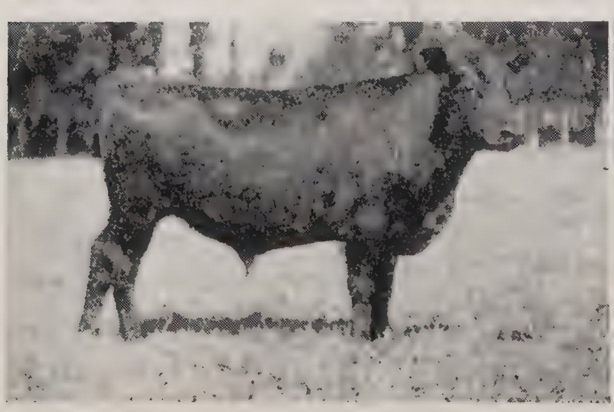
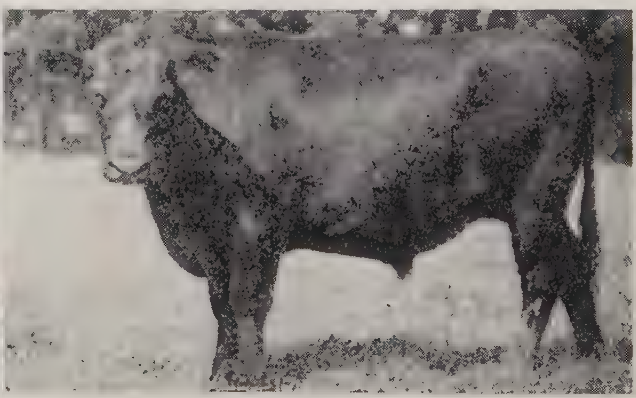
CATTLE FOR CHILLED BEEF TRADE



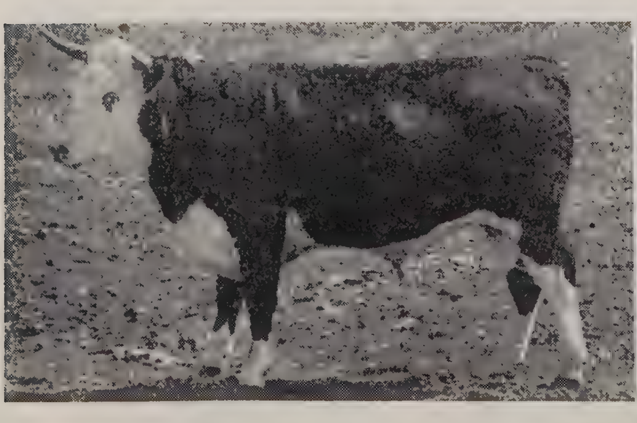
A line of purebred Polled Angus steers of good type.



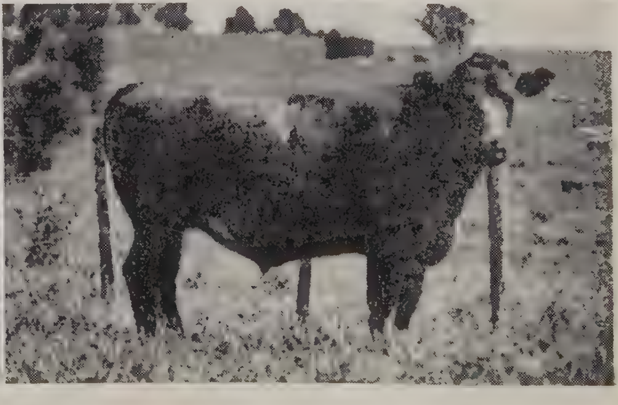
Promising chiller 18 months old. Note great depth of body and short coupling.



Good animal, but rather long in middle. Possibly better type for frozen than chilled beef.



Excellent type of steer, 18 months old; running with mother since birth. Dam a Polled Angus-Hereford cross, mated to Hereford bull.



Good type of steer from a Polled Angus cow mated to a Shorthorn bull.

the rate of growth 12 11-months-old steers purchased on June 26, 1936, were selected to ascertain periodically their body weight gains up to time of slaughter. Each animal was branded on September 10, 1937, and weighed. The following table shows the individual weights and the average daily increase in pounds per beast up to October 28, 1937.

LIVE WEIGHT (lb.).

Steer No.	Date of Weighing. 10/9/37.	30/9/37.	15/10/37.	28/10/37.	Average daily gain.
1	1,287	1,327	1,383	1,472	3.85
2	1,138	1,176	1,204	1,232	1.95
3	1,152	1,196	1,288	1,295	2.97
4	1,270	1,316	1,379	1,459*	3.93
5	1,119	1,171	1,222	1,288*	3.52
6	1,141	1,183	1,260	1,299	3.29
7	1,082	1,145	1,188	1,252*	3.54
8	1,138	1,174	1,216	1,281	2.97
9	1,074	1,127	1,195	1,250	3.66
10	1,144	1,183	1,243	1,264*	2.50
11	1,202	1,272	1,295	1,355	3.18
12	1,120	1,180	1,250	1,278	3.29
Average weight per beast ..	1,155.5	1,204.1	1,256.9	1,310.4	
Group increase (lb.) per day per beast	2.4		3.5	4.1	

*Withdrawn and killed at Horotiu Freezing Works.

It will be noted how the average daily increase in weight went up as the feed became more plentiful.

On October 28 four animals from this group, Nos. 4, 5, 7, and 10, were selected and placed in the chilled beef competition at the Waikato Agricultural and Pastoral spring show the following day. No prizes were secured by these animals on the hoof at the show, but when slaughtered in the Horotiu Freezing Works on November 1 a first prize was allotted to No. 7 and a second to No. 5. There were 36 entries in the class.

The following is a report from the judge who made the awards:—

> The 36 entries in the Auckland Farmers' Freezing Company Cup for the steer most suitable for the chilled beef trade when judged "on the hooks" at Horotiu were a very nice lot, and, with the exception of one very fat and four rather heavy, the remainder were very even and ideal for the trade.
>
> The quality and finish left little to be desired and the placing of first, second, and third proved rather difficult.
>
> In a class such as this there are usually one or two outstanding carcasses, but in this case there were 13 equal in points.
>
> The final decision was made after quartering when the thickness of eye of meat, colour, and covering of fat were revealed.
>
> No. 52 (Ruakura Farm No. 7) was placed first for the even distribution of fat all over the carcass, medium bone, full, well-rounded buttock, large eye of meat of fine texture and colour, and well marbled, with what I consider the correct proportion of fat to lean: a real good cutting carcass and a handy weight of 689lb. No. 51 (Ruakura Farm No. 5) was placed second—a very similar carcass in conformation, full of good lean cutting, but fat not so evenly distributed, and the colour of meat slightly dark—weight 705lb.
>
> Steer No. 4 was faulted for being over weight, killing out at 777lb.

The balance of 8 animals out of this first group of 12 were sold in the paddock on December 9, 1937, at the rate of £2 per 100lb. Their dressed weights on the hooks at Westfield were as follows:—

Steer No.	1	827lb.
"	2	781 "
"	3	785 "
"	6	788 "
"	8	801 "
"	9	710 "
"	11	793 "
"	12	749 "

The consignment realised £119 9s., an average price of £14 18s. 7½d. per head.

Trial No. 2.

It was thought that by calving cows in December-January and wintering the calves on their mothers more rapid growth rates could be obtained without supplementary feeding other than hay, and that by late calving the cows and calves would not seriously compete with the ewes for early spring grass.

A group of 16 steers was selected from calves born in December, 1936, and January, 1937; these calves were wintered on their mothers running on grass with a little hay and were weaned at the end of August. At the selection, branding, and first weighing on October 20 live weight gains were as follows:—

Date of Weighing.	Mean Live Weight.	Increase per day.
	lb.	lb.
20.10.37	463.5	—
3.11.37	507.8	3.1
18.11.37	564.4	3.7
2.12.37	583.8	1.3
16.12.37	602.3	1.3
30.12.37	637.2	2.4
14. 1.38	639.4	.2
21. 1.38	669.0	2.2
10. 2.38	686.1	1.2
24. 2.38	697.7	.8
10. 3.38	698.5	0.05
24. 3.38	728.8	2.1
7. 4.38	723.0	.4
26. 5.38	772.6	.9
16. 6.38	796.8	1.1
8. 7.38	825.4	1.3
1. 8.38	778.0	1.9
19. 8.38	814.7	1.44
29. 9.38	811.9	.07
13.10.38	859.2	3.37
4.11.38	965.8	4.8
25.11.38	967.0	.05
23.12.38	1,061	3.4
6. 1.39	1,040	1.6
20. 1.39	1,081	2.9
3. 2.39	1,091.7	.75

Animals made satisfactory growth rates until February, 1938, when dry weather burnt up pastures. Moved on to paspalum fields in April the steers were affected with grass staggers; one died and the balance were slow in recovering. A small amount of hay was fed in the interval. Five animals

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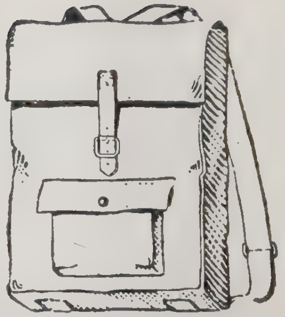

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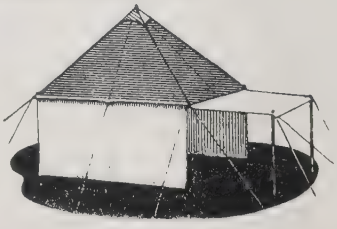

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were sold on May 1, 1939; five on May 22, 1939, and the balance on July 29, 1939. The age at slaughter was 27 to 28 months, and the average dressed weight 648.4lb.

This trial shows that really excellent summer and autumn grass growing conditions would be necessary to obviate carrying the cattle over two winters. It is possible that better average growth rates would have been attained if paspalum staggers had not been contracted.

Trial No. 3.

As far as the trials had progressed to this date it was manifest that supplementary feeding is necessary when there is a grass shortage either owing to dry weather in summer or autumn, or during cold and wet conditions during the winter, especially from mid-June to the latter part of August, when grass is usually very scarce on the average Waikato fat lamb raising farm. To enable the best possible results to be obtained it is imperative that the animals receive no check whatsoever from time of weaning to date of slaughter, but be kept steadily growing all the time. To ensure continuous and steady growth it is necessary to feed as required, and it seemed that if such practice were adopted it would be quite possible to get the animals away at a dressed weight of 650 to 680lb. at 22 months of age.

As paspalum staggers had upset the trial with the second group, it was decided to repeat the investigation with another small group of steers and heifers born during December, 1939, and January, 1940, and suckled by their dams until the latter part of August, 1940. The cows were grazed on fairly good grass pasture with sheep during summer and autumn and were fed hay, silage, and roots in addition during the late autumn and winter. After weaning the calves were grazed on good pasture with sheep during the following spring, summer, and autumn, and fed hay, silage, and roots during winter and early spring until the grass started to come away freely.

This group was not weighed periodically as were the animals in the previous trials. Two steers calved during December, 1939, and one heifer calved during January, 1940, were selected in November, 1941, and entered in the chilled beef competition and the fat heifer classes respectively at the Waikato Agricultural and Pastoral Show. The day before the show the three selected animals were placed on the weighbridge and their live weights recorded as follows:—Steer No. 1, 1,163lb.; steer No. 2, 1,175lb., and the heifer 1,070lb. The steers were not placed on the hoof at the show, but one was awarded first prize on the hooks at Horotiu, winning the Fletcher Cup for the year. The dressed weight was 636lb., 44lb. less than the goal aimed for. The heifer was placed second on the hoof and second on the hooks. The dressed weight was 586lb.

Dressed Weight Percentage

Progress figures to ascertain the ratio of live weight to dressed weight indicate that the average percentage can be taken as 55 per cent. One steer whose live weight was 1,252lb. dressed 688.60lb. three days after being through the show and after transportation to the killing works. A companion steer whose live weight was 1,288lb. dressed at 705lb. A line of 10 steers, some of them killed on the same days as they were weighed and the balance grazed in a field adjacent to the works for three to five days after being over the weighbridge, averaged out at 56.9 per cent.

To test the judgment of a number of fat stock buyers on one occasion at an Agricultural and Pastoral Show the live weight of two steers entered, and also their calculated dressed weight, were posted up. One buyer who had been operating for 20 years considered the figures were far from correct. He considered they were 100lb. too heavy on one beast and 40lb. too heavy on the other. When the animals were killed at Horotiu it was found that the calculation was 7lb. too heavy for one animal and 4lb. too light on the other. It was thus shown that if the buyer had used his judgment to work out his purchase price he would have paid much less than the seller was entitled to receive. Chilled beef at that time was selling at £2 per 100lb.

Calving Percentages

From the first mating of the Polled Angus and Polled Angus X Hereford heifers 90 per cent. of calves was obtained. Unfortunately it was impossible to obtain any accurate figures of the numbers produced from the second and third matings, as a number of the cows were transferred to another farm. From a line of pure-bred Polled Angus heifers purchased from Flock House 96.6 per cent. of calves were obtained.

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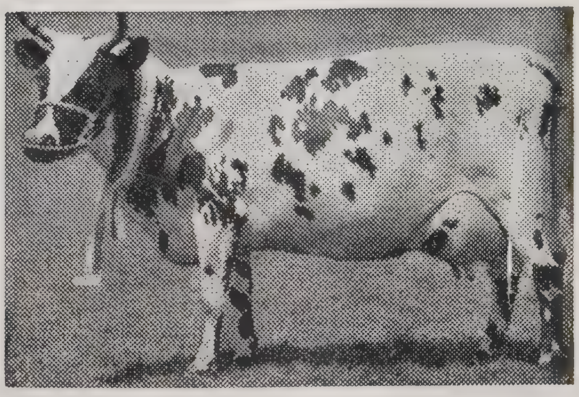

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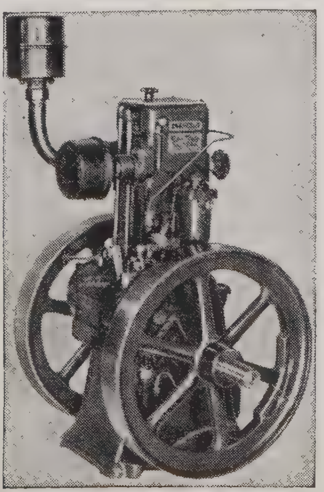

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SHOW STANDARDS IN POULTRY BREEDING ARE ESSENTIAL

By L. COCKER, *Poultry Instructor, Christchurch.*

IN assessing the value to the poultry industry of shows and show birds it is necessary to take into consideration the importance of show standard requirements. If any prominent breeder of livestock were asked whether show-standard requirements were necessary in breeding stock with the ability to transmit performance to their offspring, he would undoubtedly reply that standard requirements were still essential to maintain character and uniformity of type in any breed of livestock.

SHOW standards provide the basis for all breeds and varieties of livestock. Therefore, all breeds or varieties of stock should conform in type, character, and colour to standard requirements, or as near as possible to this standard of perfection.

Breed is determined by type. This is illustrated in the Mediterranean breeds of light poultry, Minorcas, Spanish, Leghorns, and Anconas, and in the heavy breeds, Orpingtons, Rhode Island Reds, Wyandottes, Rocks, and Sussex. As each of these breeds is distinct in type, breeders, in aiming at uniformity of breed character, must be guided by a standard of perfection.

Need for Uniformity

Without this uniformity of type breeders would be at a serious disadvantage and stock would soon degenerate. Breeders with a preference for any particular character might, by developing it to an extreme, spoil the symmetry of an animal and cause it to lose correct proportion. With poultry the purpose of standard requirements is to keep each character in proportion and make the bird both useful and attractive.

Ability to breed standard stock is really a flair, but this art may be acquired by close study of standard requirements and keen observation of the character and habits of good stock.

A breeder may in time educate himself to tell at a glance whether breeds of birds conform in type, character, and colour to standard requirements. This, however, would not be possible unless he had a standard of requirements to guide him.

One of the best ways to establish the desirable characters of a breed is by the use of standard plates. Types of birds and their standard requirements shown in standard plates educate the eye and mind and, at the same time, curb those who breed for extreme characteristics. The need for a standard plate is emphasised by the Australorp breed which, as it ranges over a combination of Orpington, Langshan, and Minorca types, is almost impossible to judge. All too often the type varies according to each breeder's fancy.

Shows

Exhibition shows are especially useful in that they provide opportunities for the learner not only to note character by comparison but also to hear criticisms of individual birds exhibited by breeders. To learn other than by observation and comparison is difficult. A breeder relying solely on observation of his own breeding stock very often acquires a false idea of their value, and he may develop to an extreme degree some fancy characteristic often detrimental to the breed. Exhibition shows should be widely supported by all reliable utility breeders, as they offer opportunities for those requiring good standard stock to procure reliable breeding stock.

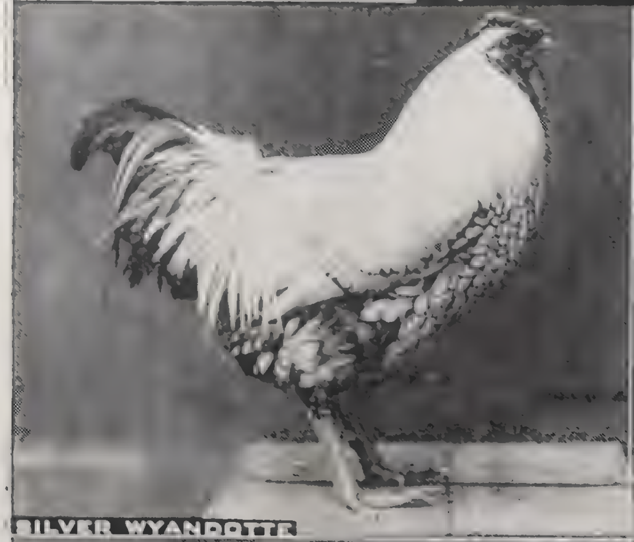
The statement often expressed that good exhibition stock are useless for production purposes is erroneous, for there are no features of exhibition standard characters which are or may be detrimental to egg-laying qualities; that is, provided the birds on exhibition are truly judged by standard requirements.

The original description and illustration for any utility breed were set out for the purpose of defining the character and qualities of an ideal laying bird, possessing beauty and productive usefulness.

If many breeders who, for reasons of their own, do not support poultry shows, did so, the standard of stock in this country would undoubtedly be raised. For confirmation it is only necessary to remember the early exhibition shows in Christchurch where utility birds first made their appearance in New Zealand, the

Upper—White Leghorn. Middle—Black Orpington. Lower—White Leghorn.

Quality Birds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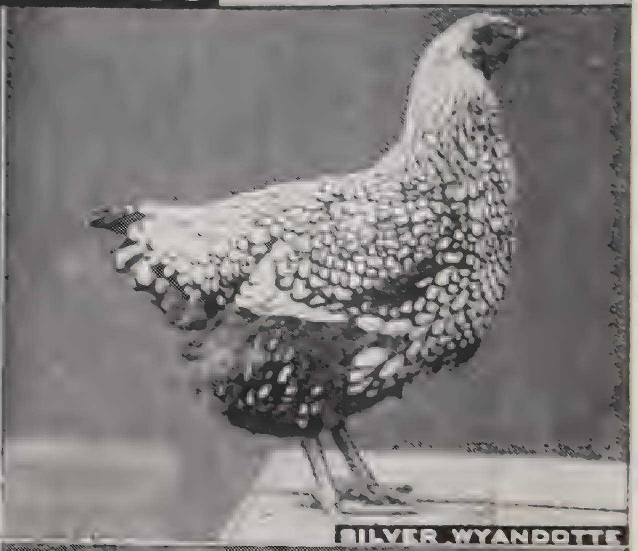
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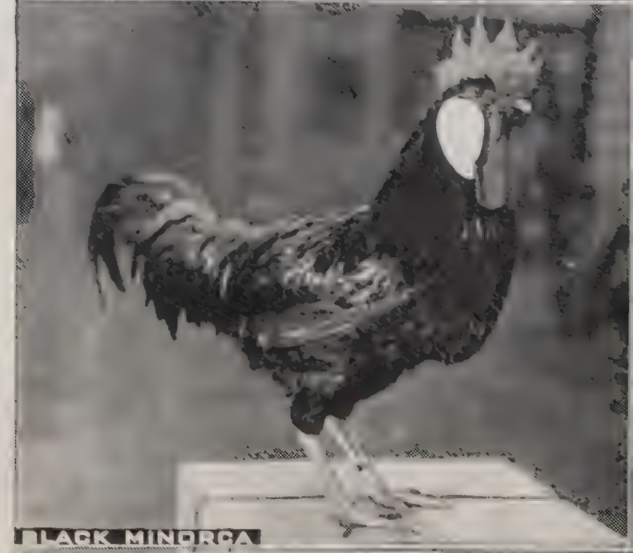
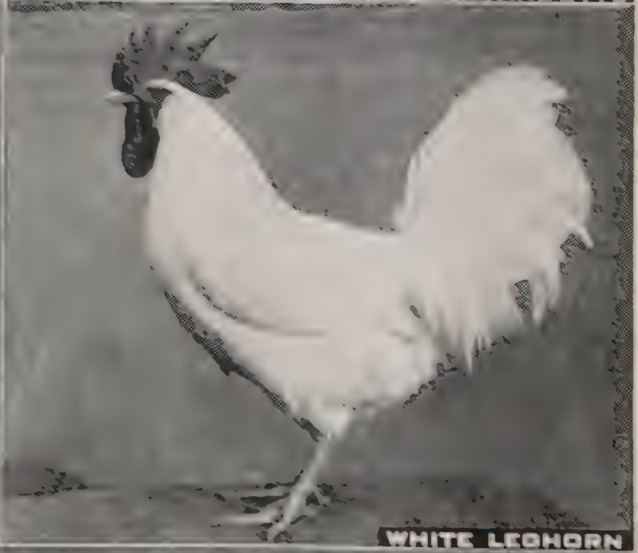
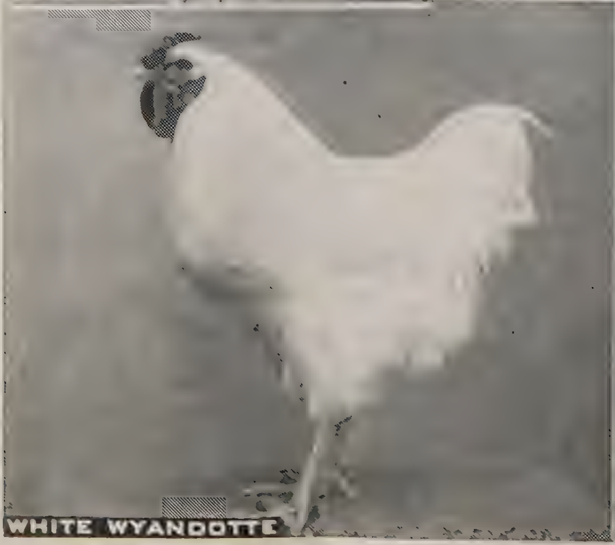

BLACK MINORCA


WHITE LEGHORN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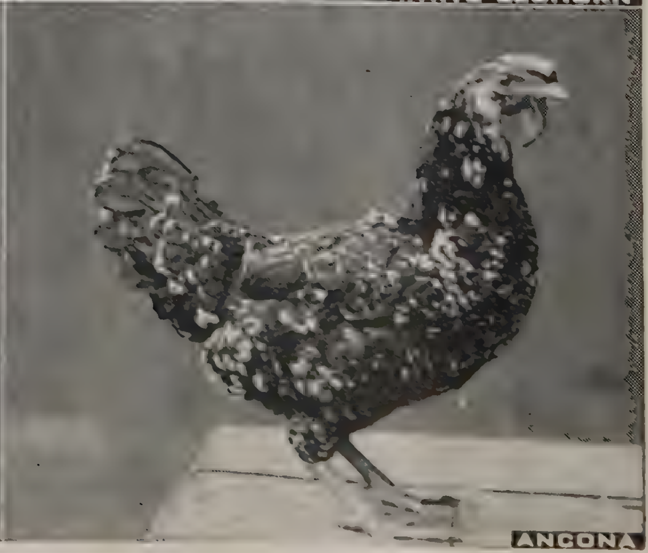
ANCONA

calibre of the exhibitors, and the marked improvement subsequently shown in utility stock.

Indifference of Breeders

Deterioration of utility stock in recent years may be traced partly to the indifference of breeders in not continuing to support shows and a consequent lack of inducement to maintain their stock at a high standard. In other words there was a falling off of ability to breed good stock.

Judges of approved qualifications must be selected if breeders are to exhibit widely at shows. Utility commercial breeders, so that their support and co-operation may be secured, must have confidence in these judges. In this way exhibitions of show poultry will be of very much greater value to the industry. The use by commercial men of standard-bred birds of proven productivity would also do much to raise the standard of poultry to the level sought in the New Zealand Poultry Flock Improvement Plan.

The future is bright for high-class standard poultry. Opportunity to dispose of such stock are better than ever before.

Standard poultry is urgently needed by most large commercial flocks for the maintenance of constitution, type, and productivity. However, if breeders of standard birds are to secure the patronage of commercial men for replacement stock, they must not ignore the importance of egg production.

The period when utility show classes lent themselves to exploitation by exhibition breeders who entered their smaller birds in utility classes is recognised as unfortunate in poultry history.

However, the question must be viewed in the correct perspective. Wholehearted support of the exhibition show movement by commercial breeders is called for. Genuine efforts should be made by exhibition stud stock utility breeders to breed to type, size, and standard breed character birds with known pedigrees of performance for maintaining or raising the standard of commercial flocks.

Show authorities must appreciate the necessity of appointing men fully qualified by experience to judge each breed. To accomplish this, young breeders should be encouraged to take an interest in various breeds so that a nucleus is formed from which men may be selected for training as future competent judges. To further the objective, a training class could be established in each centre under the guidance of competent breeders. A series of lectures on the more popular breeds could be arranged, and students encouraged to ask questions and to practise with a system of score-card judging. No system will do more to educate an interested breeder in the characters and types of breeds than score-card judging. This will eventually make a breeder competent to judge by observation and comparison—essential qualifications of good judges of poultry stock. Further, the potential judges with the greatest promise should be selected by show authorities to accompany a qualified judge during judging in order to learn, but not necessarily to express any opinion. Young competitors should not hesitate to question judges about exhibits; it is the judge's duty to educate exhibitors.

To Recognise Defects

Beginners should make themselves familiar with the standard so that they may recognise defects. Novices may often avoid disappointments by studying the standard. For instance, young birds which, but for being white in the face, would have won competitions, emphasise that exhibitors had not made themselves familiar with the standard.

If the recommendations outlined in this article are acted upon, poultry exhibition shows will be made a much more influential means of propagating high-class stock and of disseminating poultry knowledge.

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Rotation of Crops

By E. M. BATES, *Instructor in Agriculture, Alexandra.*

IT has long been a principle of arable farming that the growing of the same kind of crop on the same area of land year after year leads to soil depletion and reduced crop yield. For this reason crops are grown in rotation, and although there is now no necessity for the rigid adherence to crop sequences which was once a feature of farm practice, the same principles of rotation still apply.

UNLESS overgrazing is carried out, the natural restorative powers of a pasture more than counteract the loss of fertility in drainage and by removal of stock, especially where adequate lime and fertilisers are applied. Where frequent cropping is practised changes in fertility are rapid, because in producing the crops sold off the farm the farmer must cash in on the fertility of his land.

Rotations Compensatory

A crop may impoverish the soil in some respects and yet improve it in other ways. The ultimate effect of several different crops in a rotation is to some extent compensatory. Those crops which impoverish the soil more than they improve it may be classed as "exhaustive" crops, while crops that improve the soil are called "restorative" crops. Some crops, even although classed as "exhaustive," may improve the ground for a succeeding crop of another kind. For instance, linen flax, once considered to be "exhaustive," is now regarded as a good preparatory crop for wheat. Similarly, potatoes, although making high demands on fertility, are of special value as a cleaning crop and for improving soil tilth. The leguminous crops peas and lupins enrich the soil with nitrogen and also improve the mechanical condition of the soil.

Several successive cereal crops may damage the tilth and lower the fertility to such an extent that succeeding crops or pasture make indifferent growth. Barley and oats are both easier on the land than wheat, and if more than two cereal crops are grown in a rotation, one of these crops should be included. In a well-designed rotation the cereal crop should be sown when the soil is in good heart and a restorative crop should follow.

Restorative Crops

The most important restorative crops are mixed pasture, lucerne, and forage and green manure. Lucerne is one of the greatest fertility-building crops because of its reliability, heavy fodder production, extensive, deep rooting system, and its tendency to increase the soil nitrogen through the nodular development of the roots. A good stand of lucerne adds annually the equivalent of 4cwt. of sulphate of ammonia per acre; red clover adds about 2cwt. per acre.

In addition to providing essential feed for stock, forage crops may be regarded as cleaning or preparatory crops for cereals. They also improve fertility through the addition of dung and urine from the grazing animals. Green manure crops are wholly restorative in that they provide an abundance of leafy growth which can be ploughed under to build up the humus content of the soil. There has generally been a disinclination to plough in a large amount of green material which could be used for feed, but farmers are now becoming more humus conscious and crops such as lupins, tares, and sweet clover are being more widely grown specifically for green manure. After ploughing in a crop a month to six weeks is required for the process of decay to take place, and the sowing of a crop on the area turned under should be delayed until decomposition of the green crop is completed.

Climate and soil largely determine the rotation of crops. The high and well-distributed rainfall over much of the North Island is the prime factor in permanent pasture grassland farming, and only enough cropping is undertaken to cover winter and summer feed requirements. Particularly on store sheep country, stocking is limited by the winter carrying capacity, and winter feed is provided by turnips, swedes, and greenfeed cropped from ploughable run-out pasture before re-sowing to new grass. Greater stock numbers and better control of the summer grass flush of feed are then possible. On fat lamb-mixed cropping land rotations vary considerably according to the extent of fat lamb raising, the possibility of grass and clover seed production, and the growing of cash crops.

In any well-balanced rotation the aim should be to

1. **Maintain fertility by a suitable sequence of restorative fodder crops, alternating with cash crops, and assist growth with lime and fertilisers.**
2. **Provide adequately for livestock requirements.**
3. **Distribute labour and cultivation as well as possible.**
4. **Spread risks by a wise diversification of payable crops.**

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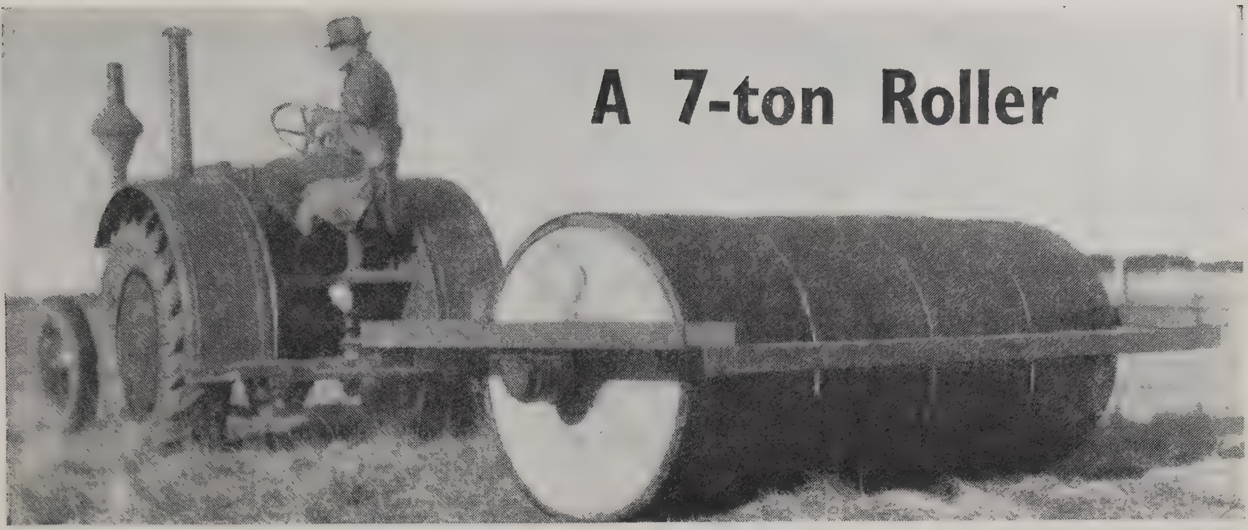


For Light and Medium Land of Canterbury

STONE heaps which are a familiar sight in some areas of Canterbury are not necessarily an indication of poor soil types. Excellent crops are grown on some of the stony country, but the wear and tear on implements is very great. Pasture management has been directed towards improving and prolonging swards to reduce the area under the plough. The heavy roller described in this article by G. K. McPherson, Instructor in Agriculture, Ashburton, is a recent idea which appears to have possibilities in attaining the same end.

EXCLUDING the alluvial deposits, which are mainly to be found bordering the Ashburton and Hinds Rivers, and also some of the deeper loess deposits such as occur on the southern bank of the Rakaia River, the soils of the Ashburton County are inclined to be stony in character, the stoniness varying both in regard to the quantity of stones present and also their size. In some areas the stones are small and few in number; on the other hand there are localities in which stones at times appear to occupy more of the surface area than does the soil. In some areas throughout Canterbury stone heaps are a familiar sight on the farm. To facilitate the cultivation and the cropping of the areas the worst of the stones have been collected and placed in heaps. The presence of stones, however, does not necessarily mean a poor soil type. In fact some of the very stony country will grow excellent crops.

On the better-class stony country wheat is a regular crop in the cropping programme. Oats are perhaps the main crop on the medium stony country, while the light stony country is used almost exclusively for sheep farming. Whatever the type of farming practised, however, pastures are of prime importance.

Implement Wear and Tear

It will readily be realised that the wear and tear on implements operating in stony country is very great. Breakages are many and repair bills high. Any new idea, therefore, which can be introduced to improve and prolong the life of the pastures on the stony country, and thereby reduce the area under the plough, is worthy of every consideration.

Liming, topdressing, and the use of improved strains of grasses and clovers have all played their part in this direction. In many cases, also, subterranean clover has proved extremely valuable. Today, on the plains land of Ashburton County, there can be seen subterranean clover-dominant pastures 6, 7, and 8 years old, on land where originally the normal economic life of the pasture was a matter of 3 to 4 years or less.

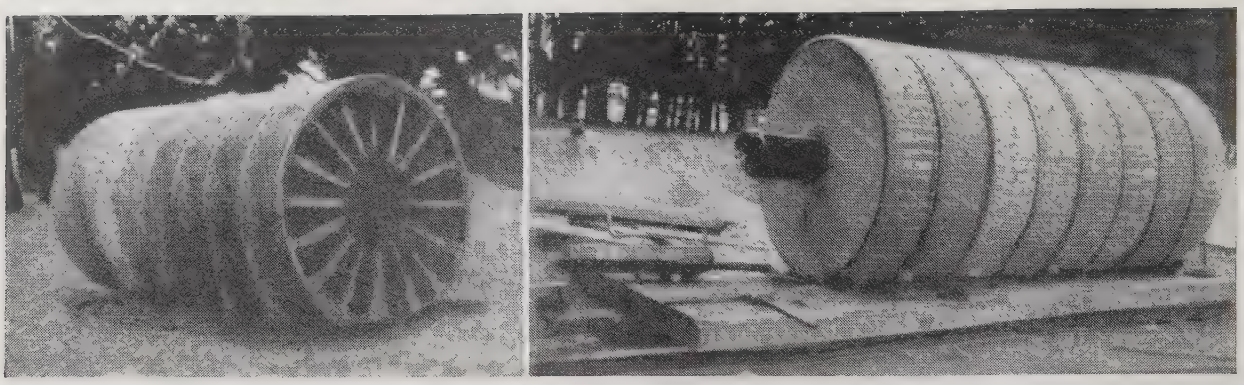
Another idea introduced recently and having the same object is the heavy roller. To what extent it will tend to improve and prolong the life of the pastures on the plains land of the county is yet to be demonstrated, but it does appear to possess possibilities in this direction. There are probably several different kinds of heavy roller already in use on farms throughout New Zealand, but a description of the type recently constructed by Mr. E. H. Davis, Ealing, Mid-Canterbury, and now being used on his young grass pastures may be of interest to readers.

Strong, Neat Roller

The idea that a heavy roller might possess many advantages on his farm had been in Mr. Davis's mind for a long time. The problem was what was the best kind of roller to construct which would do the job most efficiently. The roller had to be of sufficient weight for the purpose intended; it had to be relatively cheap, and the draught suited to the power available. Mr. Davis has built a strong, neat roller, which seems to have solved all these problems very satisfactorily.

The first idea that occurred to Mr. Davis was to use a traction engine boiler, cut into suitable sections as a casing for the concrete; and it was while visiting a local engineering firm to enquire as to the prospects of obtaining a suitable boiler for the purpose that he noticed some old 10/20 McCormick-Deering tractor wheels lying in a corner of the yard. It immediately occurred to him that these wheels, already adequately reinforced, would be preferable to the boiler, and was informed that they were available if he wanted them.

Having decided on the wheels as suitable for the job, the next points which had to be considered were, what width to make the roller, i.e., how many wheels would be required, and second, into how many sections would it be necessary to divide the roller to facilitate turning at the headlands without unduly disturbing the pasture. Each wheel has a width of



Left—The wheels welded together in pairs before filling with concrete. Right—The roller (still on the platform) filled with concrete and with the axle inserted.

12in., so it was decided to make the roller 8ft. wide, divided into four separate sections of 2ft. each, i.e., each section was to consist of two wheels welded together. Two further important points had to be considered: the size of the axle and the type and the dimensions of the axle casing. To be a success, the roller had to have weight and strength, and at the same time be reasonably manoeuvrable. Further, it had to be strong in every part. The old saying that a chain is only as strong as its weakest link applied in this case. A 4½in. steel axle, weighing approximately 5cwt., was therefore decided upon. It was also decided to make the axle casing of ¼in. steel, with an inside diameter of 5in., i.e., a half inch larger in diameter than the axle.

Construction Method

Having decided upon the kind of roller to build and also on the principal measurements, the next task was the actual construction of the roller. For this purpose the services of a tradesman in concrete work were considered desirable. Briefly, the method of construction was as follows:—

A strong platform of sufficient length to hold four sets of wheels was erected in a convenient corner of the yard. It was essential, of course, that this platform be made dead level. The next step was to arrange the wheels, welded together in pairs, on the platform. The axle casing for each set of wheels was then arranged in dead centre position. As will be realised, this is all important. Should the axle casings vary the slightest fraction out of true alignment, fitting the axle itself into position would create a very difficult problem, and, even when fitted, wear, either of the axle or of the axle casing, would take place.

As mentioned earlier, the steel spokes of the tractor wheels provided excellent reinforcing for the concrete, and any old pieces of scrap iron or tractor grips welded to the axle casings served as suitable reinforcing to bind the casing with the concrete and thus make an extra strong job.

Clean river shingle was used, and cement added to give a 5 to 1 mix. To complete the four sections approximately 4yds. of shingle and 11 bags of cement were used. As each section when filled with concrete weighs approximately 33cwt., provision for lifting the wheels off the platform and placing them in position to receive the axle had to be made. Tractor grips bolted loosely to each section prior to filling them with concrete served this purpose very well.

After filling with concrete the sections were left lying on the platform for approximately one month before they were moved. Leaving them for this period, however, was not essential. A fortnight would give the concrete time to set sufficiently, although it may not be advisable to use the roller until a month or two months have elapsed.

Having arranged each section in position, using an endless chain for this purpose, the axle was then inserted. Mr. Davis mentioned that the weight of the axle (5cwt.) combined with the necessity of getting each section in line made this job a rather difficult one. The total length of the axle used was 10ft. 2in. This allowed 9in. for the frame and a further 4in. overlap between the frame and the roller itself on either end of the roller.

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Filling the sections with concrete.

The latter 4in. space was filled with suitable-sized washers.

As the axle was being fitted into position, a steel washer ¼in. thick, with an inside diameter just sufficient to slide over the axle, was placed between each section of the roller. This would prevent adjacent sections of the roller rubbing against one another. Two circular skeith blades could replace the washer. The space between each section should be just sufficient to prevent wear by rubbing. If the space is too large, small stones are liable to be picked up, and in addition rolling will result in an uneven surface.

The main part of the frame consists of 9in. x 3in. channel iron with stays of 3in. x ½in. flat iron, and a drawbar of railway iron 8ft. long. The various parts of the frame were welded together by a local blacksmith, and this has resulted in a very strong and compact job. Actually only 8 bolts were used in the construction of the roller—four on each side for attaching the axle bearing to the frame.

Mr. Davis estimates the weight of his roller at 7 tons, or approximately 17cwt. per foot of width; and his 35 h.p. tractor will pull the roller at a speed of 4 miles an hour in third gear quite easily. Even from a standing position there is no difficulty in setting the roller in motion.

Roller's Capabilities

Naturally there is a good deal of discussion as to what the roller will accomplish, what it won't accomplish, what harm it will do, if any, and so on. It should be borne in mind that the roller has been constructed for the sole purpose of rolling grass paddocks any time at all after they have become reasonably well consolidated. There are some things the roller will do, and there are others which, at the moment, are a matter of conjecture. Obvious advantages which readily come to mind are:—

(a) By pressing stones into the ground it will facilitate topdressing and liming of paddocks on stony country.

(b) Stones interfere with the cutting and gathering of hay crops. The heavy roller described will bury the stones more efficiently, and will provide a better surface for hay-making operations than the Cambridge roller.

(c) By pressing the stones into the ground it will enable a header-harvester pick-up to be used in stony country with reasonable safety. Mr. Davis's farm is situated between the Hinds and Rangitata Rivers. In the 1940 season there were 10 header-harvesters owned by farmers residing in this area. In the 1945 season the number of header-harvesters had increased to 36. An expansion in the acreage of wheat and lupins during the past few years is largely responsible for the increase in the number of headers operating in this territory. The production of grass and clover seed, however, has also increased in the stony country, and the header-harvester pick-up is frequently used when harvesting these seeds.

Pasture Improvement

In addition to the points mentioned above, the use of the roller may lengthen the economic life of the pastures. As a general rule it will be found that wherever considerable consolidation of the ground has taken place ryegrass, white clover, and subterranean clover tend to survive and produce much longer than on the freer soil types. In other words, consolidation of the soil seems to delay the ingress into the sward of inferior grasses such as sweet vernal and hair grass.

Experience from the Methven district, where a much lighter roller than the one described has been used, appears to confirm this tendency. But more evidence is really required completely to confirm the effect the roller is likely to have in this direction. Even if the economic life of the pasture were increased by a matter of 12 months, the use of the roller would be amply justified.

Grass-grub damage is usually most extensive and widespread on the dry light and medium soil types of Canterbury, particularly when these are

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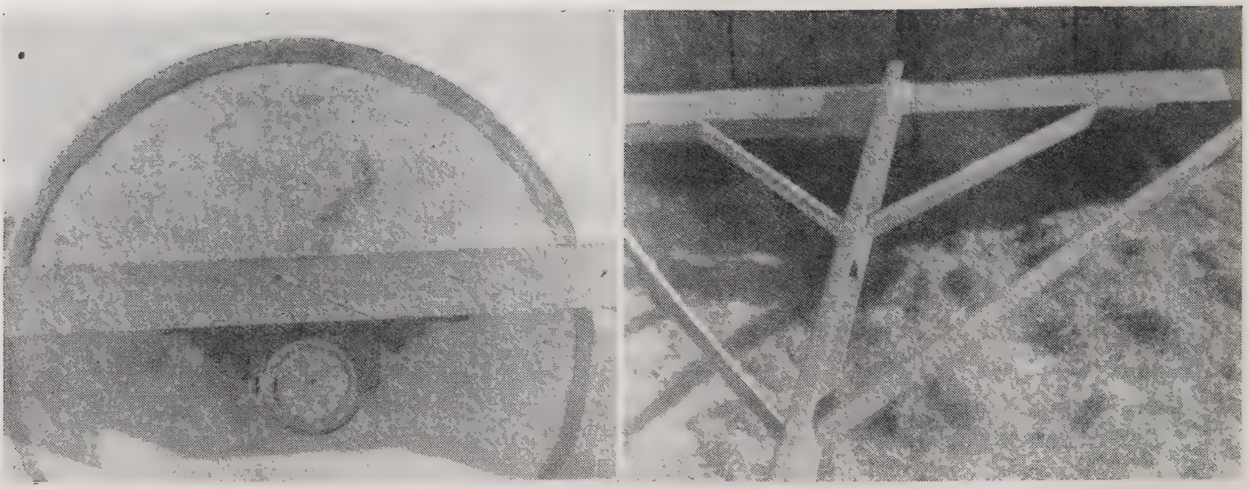

Left—Axle and bearing. Right—Showing the welding of various parts of the frame.

freely aerated. In the past the Cambridge roller (weight approximately 25cwt.) has frequently been used to roll grass paddocks showing evidence of grub damage. Here the principal aim of the roller has been to pack the soil around the roots of damaged plants, and by so doing encourage re-rooting. The Cambridge roller, because of its weight, has been used as a cure, i.e., to endeavour to repair the damage, not as a preventative. The absence of grass-grub damage on roadsides, tracks across paddocks, around gateways, etc., is evidence that consolidation does discourage the grass-grub. But experience alone will determine whether consolidation of the soil by the concrete roller described will render a paddock less susceptible to grass-grub attack. It would appear to possess possibilities in this direction, particularly if the rolling could be done in October, just prior to the flight of the beetles. It is unlikely that heavy rolling of a grub-infested paddock will reduce or minimise the damage by actually killing an appreciable number of grubs. Investigation in a paddock showing obvious signs of grub damage, and rolled with a 9ft. roller weighing approximately 8 tons, showed that even grass-grubs within half an inch of the surface were not affected in any way whatsoever. The only grubs killed were those which had apparently been squashed between stones. It may be of interest to record here that grass-grub counts were also taken in the tracks made by a traction engine weighing approximately 10 tons, which travelled across the same paddock. Here the main weight of the engine is concentrated on the two back wheels, yet live grubs could still be found. It was only where the traction engine had travelled backwards and forwards on the same trail that an almost complete kill of grubs had been obtained. It seems obvious, therefore, that it would be impracticable to construct a roller of sufficient weight to kill the grubs.

Possible Disadvantages

Heavy rolling of the light and medium land would appear to possess many advantages. Are there any disadvantages? The only obvious one at the moment is that compaction of the soil may make future cultivation more difficult. In the Methven district a very stony paddock of Italian ryegrass was rolled with a heavy roller in June, 1944. The paddock was ploughed in February, 1945, and the farmer considered that the rolling had definitely made the ground more difficult to plough. In another instance where the time between rolling and ploughing was approximately 2 years no adverse effect from the rolling was noticed. Obviously this aspect of heavy rolling is one on which it is desirable to obtain further information.

So far as Mid-Canterbury is concerned, heavy rolling of grassland is at present in its infancy. There are many points requiring solution: the best time of the year to roll, and the optimum moisture content of the soil to obtain the most beneficial effects from rollings are but two of the problems waiting to be solved. Until more is known regarding the actual effect of the roller on the soil indiscriminate rolling may not be advisable. In a future issue of the "Journal" the experiences of some of the farmers who have used heavy rollers will be described.

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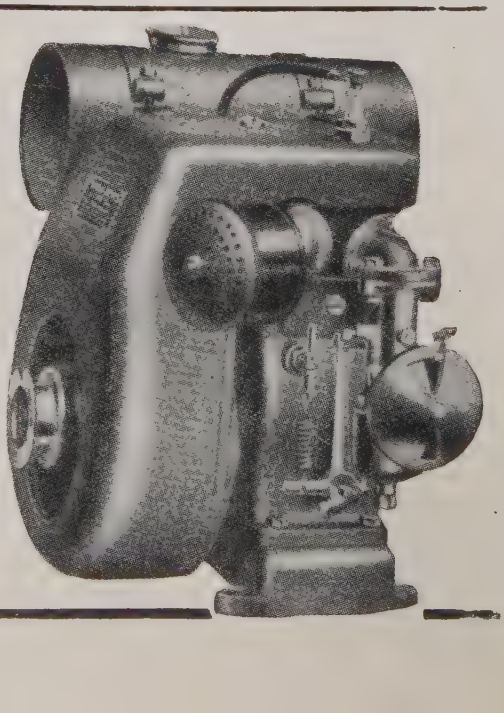


SCALE INSECTS THAT AFFECT CITRUS TREES

By P. EVERETT, Orchard Instructor, Kaikohe.

SIX species of scale insects are liable to become serious pests of citrus trees in New Zealand unless adequate control measures are adopted. These pests are described in detail in this article, which also sets out the most effective methods for control.

ALL scale insects find sustenance by piercing the outer tissue and sucking plant juices from the host. Many species exude a sticky substance known as honey-dew, which lodges on the foliage, branches and fruit, and in turn becomes the host of sooty-mould fungus, which is so detrimental to the appearance of the fruit and tree.

Effective control can readily be secured when the scales are in an immature stage of development. It is necessary therefore to possess knowledge of the different species to effect satisfactory control with the minimum of expense.

A brief description of the six species follows:—

1. **Red Scale** (*Aonidiella aurantii*): A circular, flattish scale slightly larger than a pin's head, dull red to brown in colour, and turning greyish with age. This, the most troublesome of all scale insects on citrus, is common in all citrus-growing districts. It is also the most difficult to control. No honey-dew is produced.

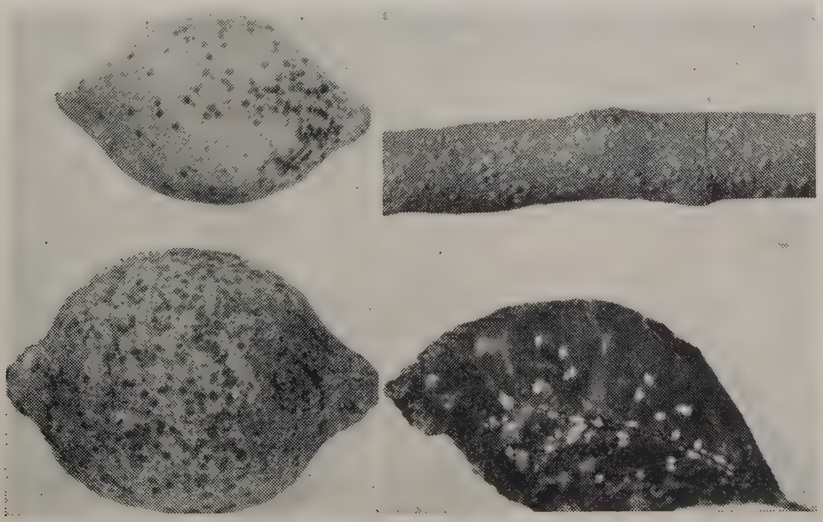
2. **Olive Scale** (*Saissetia oleae*): The shape is oval to circular and flattish when young, but becomes raised when reaching maturity. The colour is brownish changing to black. This species, in all stages of development, is readily identified by a raised marking in the form of the letter "H." The adult is slightly smaller than a lady-bird. Copious supplies of honey-dew are produced.

3. **Hemispherical Scale** (*Saissetia coffeae*): Similar in size and shape to the olive scale, but has a smooth shell, and is a light-brown colour.

4. **Circular-black Scale** (*Chrysomphalus rossi*): The shape and size are similar to red scale and the colour is black. This species, which seldom attacks lemon trees, is not present in some citrus districts.

5. **Hard Wax Scale** (*Ceroplastes sinensis*): The young are pure white, but soon develop spots which give the insect a star-like appearance. It is more or less circular. In the adult stage it has a diameter of about ⅛in. and is covered by a hard, waxy shell. The colour of the adult is a dirty-white. Honey-dew is produced.

6. **Soft Wax Scale** (*Ceroplastes destructor*): This recent introduction is an uneven circular shape, with a diameter of ¼in. or more when fully developed. As the colour is snow-white the insect is most conspicuous. It is covered with a waxy coating the consistency of butter. The pest is believed to be confined to a relatively few orchards. The appearance of soft wax scale in orchards not formerly infected should be immediately reported to the orchard instructor for the district.



Red scale. Left, on lemon fruits; upper right, on wood; lower right, on foliage.

Advice on Control

Spraying with a certified brand of summer spraying oil gives the best control of all scale insects on citrus. The dilution may be varied according to the species to be controlled. For olive, hemispherical, and hard wax scale a dilution of 2 per cent. is advised. However, to secure a good control of red, circular-black, or soft wax scales it is essential that a 3 per cent. dilution be used.

To secure effective control of the red, circular-black, and soft wax scales, the first application each year should be made in the early half of February. If infection is severe or soft wax scale is present, a further application should be made from four to six weeks later. Where infection is light and there is no soft wax scale the second application can be delayed until about mid-May, which is the best time to spray for control of hard wax scale.

As olive and hemispherical scales breed throughout the greater part of the year, sprays can be applied at any time with good results. Where Bordeaux mixture sprays are applied for the control of verrucosis or citrus brown-rot and there is a light infection of hard wax, hemispherical, or olive scales it is advisable to add 1½ per cent. of summer spraying oil to the mixture, thereby avoiding the necessity of a double spray application.

The number of spray applications required depends upon the degree of infection and the thoroughness of application. Where trees are moderately open and good spray coverage is secured the spray will be much more effective than where the trees are dense with foliage. A fine, misty spray applied at a pressure of not less than 300lb. to the square inch gives best results.

Citrus Verrucosis

On citrus fruits verrucosis appears in the form of raised, scabby lesions,

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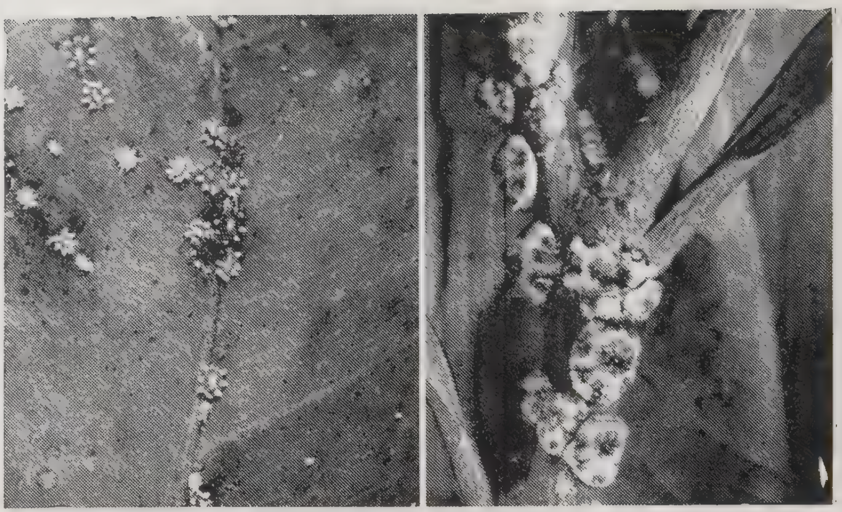
varying in size from a pinhead or smaller to about half an inch in diameter; sometimes large wart-like distortions are formed with a scabbed area on the apex. On the foliage infection generally takes the form of conicle pimples or fawn-coloured scabbed areas.

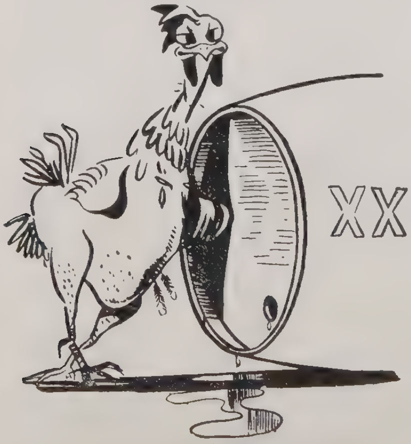
Verrucosis spreads from old infections to very young fruits and leaves, which become progressively resistant with age, and practically immune when leaves are an inch wide or fruits about an inch in diameter. Although mature leaves and fruits are immune from infection, old lesions remain viable and will continue to expand regardless of host maturity.

The disease is readily controlled by applying Bordeaux mixture 3—4—50 when young fruits or leaves are forming. The success of the spray depends largely on making the application when the blossoms are mainly at the petal-fall stage, as this is the most susceptible period of growth for infection. For grapefruit and mandarin, spring and early summer applications are generally sufficient to ensure a clean crop, but with lemons an autumn application of Bordeaux is also essential in infected orchards. This should be made at the petal-fall stage of the earliest main autumn blossoms. The Meyer variety of lemon is much more susceptible to attack by verrucosis than the standard varieties, and it is much more inconsistent in its blossoming periods, all trees of this variety seldom blossoming at the same time. These two factors generally make it necessary to spray Meyer lemons more frequently than other varieties. Immature Meyer fruits are readily injured by Bordeaux spray when the mixture is applied at a greater concentration than 3—4—50.



White wax scale. Left—Young "star" forms on leaf. Right—Adult scales on twig.

* * *



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COVER CROPS FOR CITRUS SOILS

By P. EVERETT, Orchard Instructor, Kaikohe.

It is most important to maintain at a high level the supply of humus in citrus orchard soils. The most common method of achieving this is by growing between the trees green crops which are later worked into the soil. Leguminous crops are of particular value for this purpose because nitrogen gathered from the air by such plants is stored in root nodules. Suitable leguminous crops include blue lupin, peas, vetches, and red clover. Of the non-leguminous crops oats or mustard are satisfactory.

Lupins are the cover crop most popular for citrus orchards. They can stand considerable frost without injury, are not unduly damaged by ordinary orchard traffic, generally provide the greatest bulk of vegetable matter, are readily incorporated with the soil, and, in the main citrus districts, continue to make good growth during the winter.

The land should be well cultivated before sowing the seed. The application of about 2cwt. per acre of superphosphate or ground rock phosphate at time of sowing will greatly benefit the crop. Lime should not be applied with lupin seed. The seeding rate recommended for lupins is 2 bushels per acre, which may be broadcast and harrowed or disced in. Drilling of seed is advised if the seed-bed is very dry.

Sowing Dates

Crops sown too early are liable to compete seriously with the trees for available soil moisture if there should be inadequate rainfall during the autumn months; also, early sowing means a higher crop during the winter harvesting period, when conditions are damp for the pickers and ladder-work, in particular, is more laborious. It is important, however, that the crop should be worked into the soil not later than early August, so that the temporary ill effects on the soil caused by the decomposition of the vegetation will have passed before the start of the critical blossoming period. Lupins should be forming pods when worked in so that maximum benefits are obtained from the crop.

Sowing of lupins, peas, vetches, and red clover between the middle and end of February is recommended provided there is soil moisture at that time sufficient to ensure good germination of the seed and subsequent crop establishment. Mustard and oats may be sown until the end of March.

Subsurface Broadcasting

New Type Coulter Trials on Linen Flax

By A. G. ELLIOTT, *Fields Superintendent, Dunedin, and*
A. O. GIDALL, *Linen Flax Section, Timaru.*

A BRIEF description of a new type of coulter designed by Mr. J. E. Holland, of Avoca Valley, near Christchurch, and the results achieved with it on wheat crops were published in the January issue of the "Journal." In the 1944-45 season officers of the Department of Agriculture, in collaboration with the Linen Flax Section of the Industries and Commerce Department, carried out a comprehensive trial on a specially-leased area of land at Pleasant Point, South Canterbury, during which comparisons were made between the new type and ordinary coulters sowing at rates of 60, 90, 115, and 125lb. of Liral Crown linen flax seed per acre.

THE previous crop on the trial area was rape for seed production, and the preparation of the land was carried out in the usual manner for the linen flax crop. Sowings were made on October 10 and there were 8 replications of each treatment in randomised blocks, each plot being 2 chains long and 7 coulters wide.

Establishment on all plots was good and the evenness of distribution in the new type coulter sowings was such that it was almost impossible to distinguish individual coulter rows.

At harvest, all plots were pulled by machine and the material taken over by the Linen Flax Section for examination and processing at the By-Products Factory at Washdyke.

Diameter of Straw

A sample consisting of 2,000 straws from each plot, a total of 16,000 straws, was taken and the diameter of each straw was measured. Study of these data shows that the new type coulter method of sowing has resulted in the production of a crop in which a greater number of stems are of approximately the same diameter than is the case where the ordinary coulter is employed. Stems are considered to be of approximately the same diameter when they do not vary by more than half a millimetre. The fact that a crop contains material in which variation in stem diameter is small, that is, one with a large percentage of medium diameter straw and a much smaller percentage of fine and coarse straw, is a definite advantage and decreases difficulties in processing.

There was no difference in average length of straw between crops sown with the new type and ordinary coulter, but both showed a decrease in length at the heavier seeding rates.

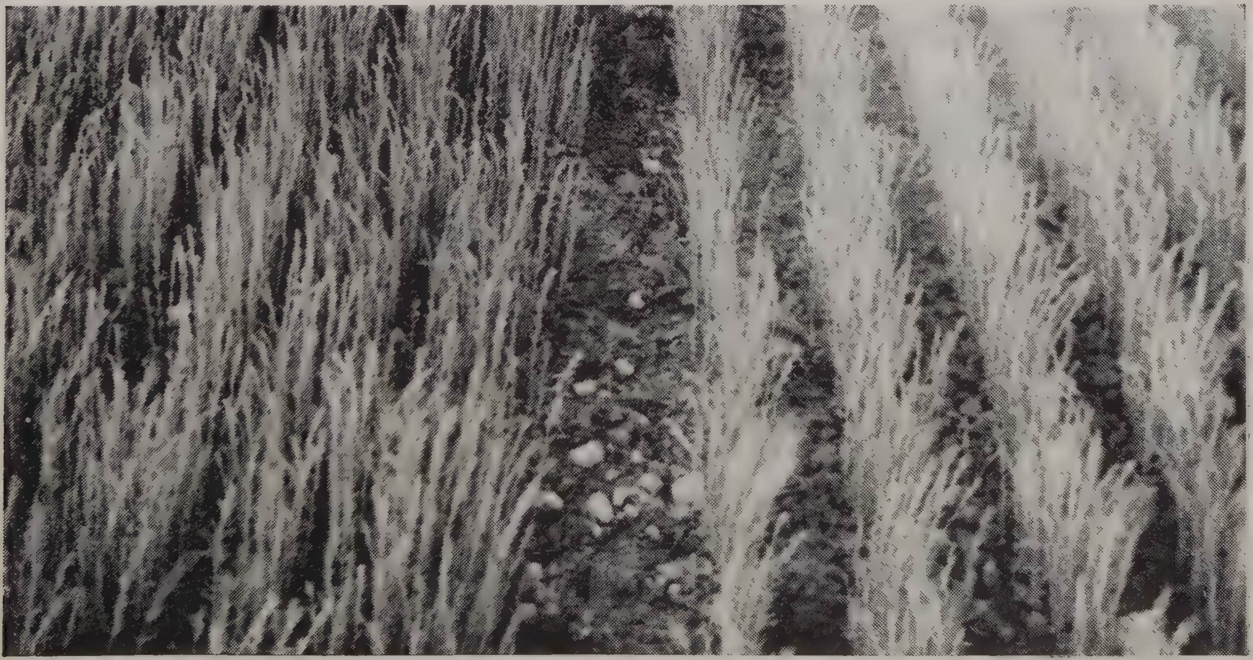
Yields

In yields both of deseeded straw and fibre the new type coulter sowings gave results which, under statistical examination, were significantly greater than those from the ordinary coulter.

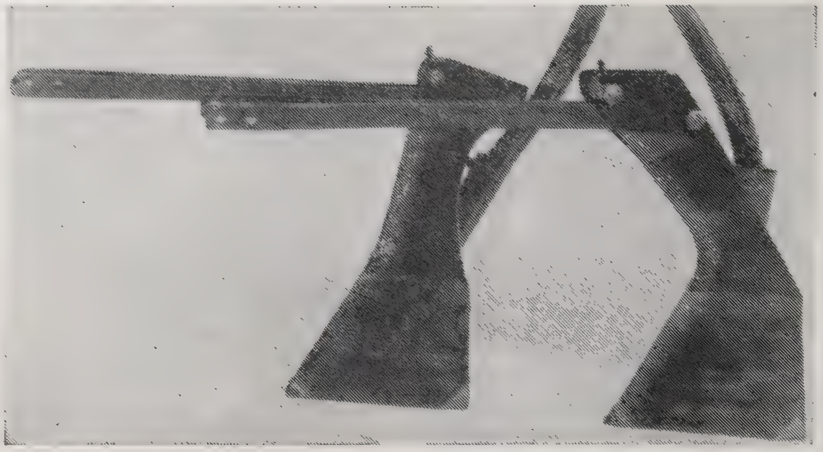
Tabulated details of yields follow:—

Type of Coulter.	Deseeded Straw. lb. per acre.	Total Fibre. lb. per acre.
New	4,130	588
Ordinary	3,850	536

The figures shown above are the mean over all sowing rates. New type coulter sowings are superior at seeding rates of 115 and 125lb. per acre, but there is no difference between sowings with the two types of coulter at rates of 60 or 90lb. per acre.



Linen flax seedlings. Left—Sown through the new type coulter. Right—Sown through ordinary coulter.



New type coulter, side view.

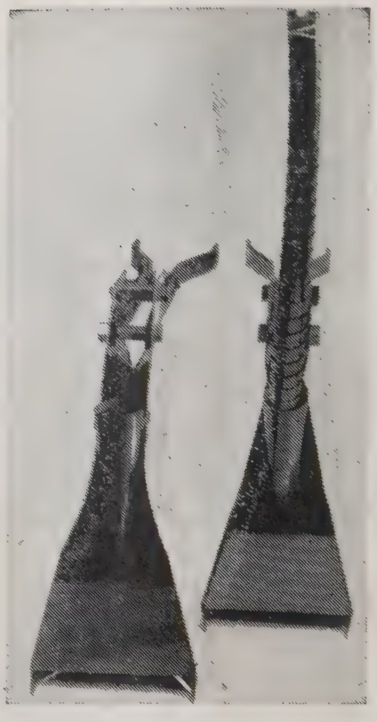
Seeding Rates Irrespective of Type of Coulter:

There was no significant difference in fibre yields between sowings at 125 and 115lb. per acre, but both these rates gave significantly better yields than did the 90lb. rate and the latter is better than the 60lb. seeding per acre.

Summary

Results from this trial have supplied the following valuable information:

1. Sowing with the new type coulters has given a more even distribution of plants at all rates of seeding, resulting in a crop more free from weeds and giving a higher fibre yield than where ordinary coulters were used.
2. The evenness of distribution of plants has been responsible for the production of a greater percentage of stems of medium diameter than is the case in crops sown with the ordinary coulter. This is a particularly important factor in processing linen flax.



New type coulter, rear view.

Yields of Fibre in Pounds Per Acre.

Type of Coulter:	Rates of Seeding.				Means.
	125	115	90	60	
New	704	677	526	445	588
Ordinary	569	611	536	427	536
Means	636	644	531	436	562

This information is particularly encouraging in demonstrating the potential value of the new type coulter, and the trial is being repeated this season.

In addition to the trial with linen flax it is proposed to investigate next season the use of the new coulter in sowing grass, clover, and brassica seeds.

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English Judges' Comment on N.Z. Selection Methods

PRIZE-WINNING entries in the Tomoana baconer competitions held at Westfield, Patea, and Hastings in July, 1945, were sent to Great Britain at the request of the Department of Agriculture for examination by the reputable judges Messrs. Hammond, Swain, and Davidson, who were responsible for the bacon-judging standards on which New Zealand judging standards were based, the object being to ascertain from those who handle our pigs in England whether the New Zealand judging standards selected carcasses best suited to the English trade.

THE report which follows, and the comments of some of the most noted bacon curers, should be of special interest to the many exhibitors in last year's baconer competitions and to pig producers in New Zealand as a whole, who will appreciate the candid criticism of those who have in the past, as at present, interested themselves in our endeavour to satisfy the English trade.

The report has little fault to find with our present carcass-judging standards, except perhaps with the method of assessing fullness of meat at the loin. One must appreciate the impossibility of accuracy in assessing this item, which because of the impracticability of making an accurate measurement of the eye muscle, can be done only by an "educated guess." Nevertheless, a close inspection of the photographs on the next page reveals little difference in fullness of meat at the loin in any of the prize-winners.

Notwithstanding that in future competitions improvement may be evolved in judging meat fullness at the loin, it is apparent that the whole system as it now stands has drawn out the best pigs. As the English judges say in their report, "These carcasses were on the whole of a higher standard than would be seen in a competition in this country (England) with the same number of entries (2,000)"; and "The carcasses are sufficiently standardised to satisfy the requirements of the British purchasers."

Compared with similar exhibits sent to Great Britain from New Zealand some six years ago, there is, no doubt, tremendous improvement of our pigs not only in meatiness of loin, but in all other factors.

REPORT OF ENGLISH JUDGES.

The following is the report of the English judges on the prize-winning entries in the baconer competitions held at Westfield, Patea, and Hastings in July, 1945:—

When, in 1936, we published details of the method which was being used by us at Smithfield to examine and report on pig carcasses from Australia and New Zealand, we made it clear that we did not think this method was perfect. While our aim in publication was to draw attention to the desirability of standardising methods of examination and judging, we suggested that the method we had up to then evolved was not to be considered as final, and that publication would give others an opportunity to make improvements.

The English judges. From left—Messrs. Swain, Hammond, and Davidson.

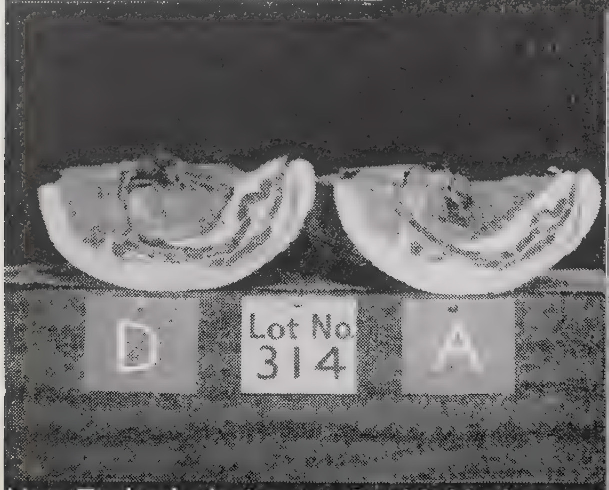
It was accordingly with great interest that we studied Bulletin No. 243 of the New Zealand Department of Agriculture describing the new bacon-judging standards evolved by the Department's technical committee, and received the Department's request to examine, according to these standards, carcasses from baconer competitions which had been judged in New Zealand.

The carcasses when we examined them at Nelson's wharf were hung up in their original lots of four, placed consecutively in order of merit according to the total score of each four, which enabled us to see at a glance the order in which the carcass groups were placed by the New Zealand method. After a general examination we studied each group, examining such points as hams, shoulders, length, etc., in comparison with the marks which had been awarded for these points.

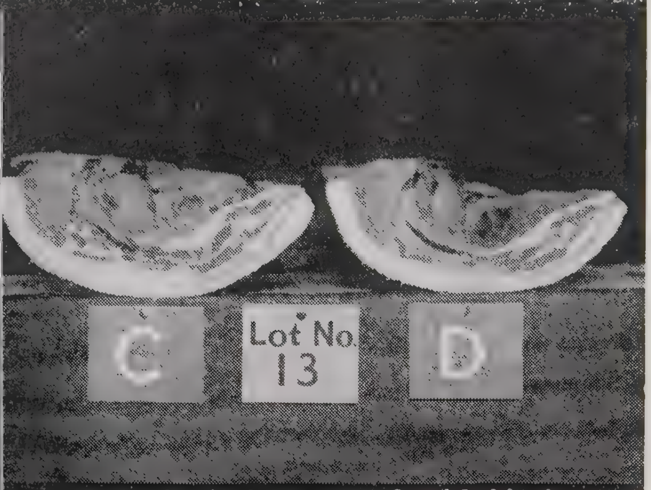
Sufficiently Standardised Carcass

Our clear impression as a result of this examination was that we agreed in practically all cases with the findings of the New Zealand judges on the points of external and internal conformation which could be examined without cutting the carcasses. All the carcasses exhibited were in our opinion of not less than high average quality. They were on the whole of a higher standard than would be seen in

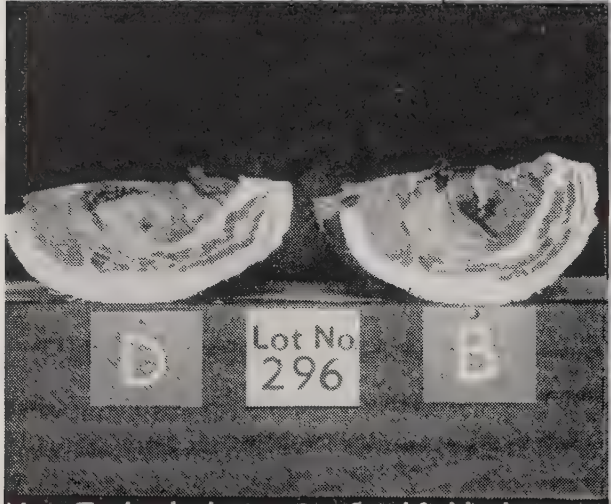
COMPARATIVE PLACINGS



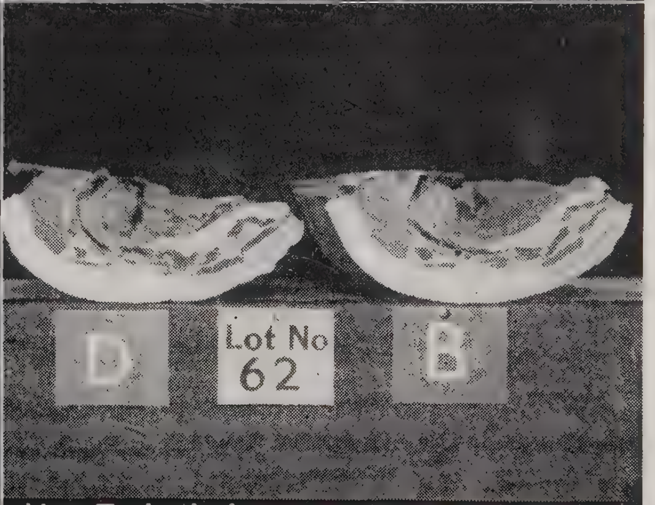
New Zealand placing 1 : Smithfield placing 4



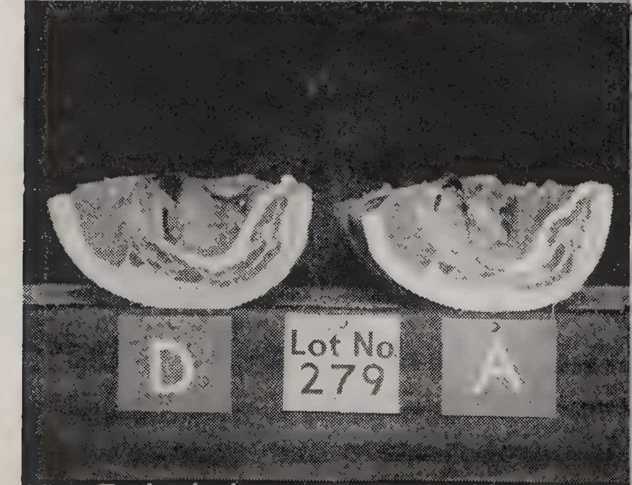
New Zealand placing 2 : Smithfield placing 1



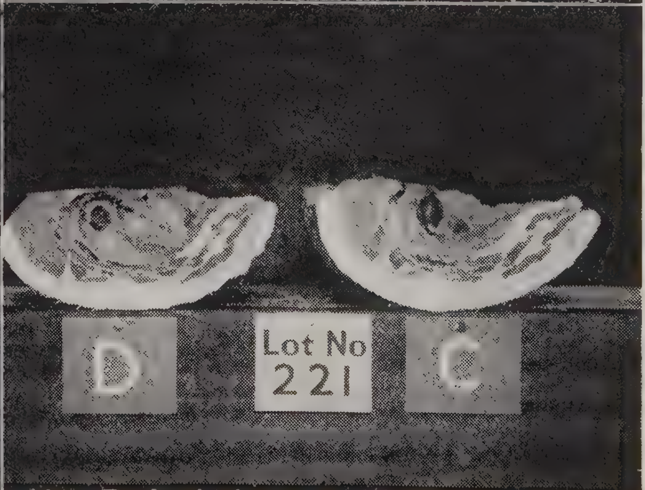
New Zealand placing 3 : Smithfield placing 2



New Zealand placing 4 : Smithfield placing 5



New Zealand placing 5 : Smithfield placing 2



New Zealand placing 6 : Smithfield placing 6

Some of the entries displayed for the English judges.

a competition in this country with the same number of entries, and they are sufficiently standardised to satisfy the requirements of British purchasers.

The reports which we have seen from a typical selection of the larger bacon curers who cured the carcasses confirm this opinion and indicate that certain factors which we were unable to examine in the whole frozen carcasses were also satisfactory.

Bearing in mind the objections to cutting carcasses under certain conditions, we are accordingly of the opinion that the New Zealand method of judging is eminently satisfactory in sorting out the type of carcass required by the Wiltshire bacon trade in this country.

Awarding Marks for Loin

Knowing, however, from experience the difficulty of correlating with accuracy external conformation and the proportion of lean meat in a carcass as indicated by "eye" of loin, and knowing the importance of this factor, we were anxious to investigate the New Zealand method of awarding marks for loin. Accordingly, after we had made a full examination of all the exhibits we selected six groups of four for detailed examination by cutting. In some of these we felt that we should probably agree with the marking for loin, and in others that we should disagree. From each group of four chosen in this way we selected two representative carcasses and cut them through the loin, which was measured according to our original method.

It will be remembered that in our "Smithfield" method we allotted for loin a total of 28 marks out of 100, whereas the New Zealand method awards only 10 out of 100. So, having measured the loins and awarded marks for them according to our original method, we had then to scale them down so that they were in relation to a total of 10 instead of a total of 28. When this was done we substituted the scaled-down marks for loin for those actually awarded in New Zealand and in this way obtained new figures for total marks. When this was done, the following set of comparative marks was arrived at:

NEW ZEALAND METHOD.

No. of Entry.	Marks for Loin (out of 4 x 10).	Total Marks.	Placing.
314	32	344	1
13	29	335	2
296	28	330	3
62	21	328	4
279	26	322	5
221	25	289	6

From these it will be seen that even giving the loin the smaller proportion allocated to it in the New Zealand method, the placings of the six groups were significantly altered when the actual amount of lean meat, as shown by loin measurements, was taken into account. Examination of the loin photographs reinforces the position as demonstrated by the measurements. In particular No. 279, placed fifth under the New Zealand marking and second according to "Smithfield" marks, confirms that assessment under the former is no more than the "educated guess" which is all that is claimed for it.

Satisfactory Quality Level

The New Zealand method, therefore, appears to us to be satisfactory for selecting carcasses on a level of quality suitable for the requirements of the Wiltshire bacon trade in this country, but it does not seem to have the degree of accuracy which would enable it to select individual carcasses in correct order of merit where this is required for the purpose of competition.

Realising fully the objections to the cutting of large numbers of carcasses, we suggest that where it is desired to select individual carcasses for the top two or three places out of a large entry, the preliminary selection might satisfactorily be made by the New Zealand method. From the small group so selected the final placing would then be accurately made only by cutting the carcasses and measuring the loin.

SMITHFIELD METHOD.

Marks for Loin (out of 4 x 10).	Total Marks.	Placing.
10	322	4
19	325	1
21	323	2
14	321	5
27	323	2
19	283	6

We are in some doubt as to whether any marks at all should be given for an "educated guess" at the value of the loin. If this item were left out, our observations suggest that the New Zealand method would still be largely successful in picking out the best quality type of pig, and

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to do this would be more logical than to weigh the result with estimates which prove to be subject to considerable variation.

Whether this suggestion be considered or not, we would repeat our appreciation of the extent to which the New Zealand committee's method is successful in bringing the general level of their pigs up to the high standard which these competition carcasses have exhibited. But we feel that in view of the evidence provided by the photographs, the relationship of methods designed respectively for general grading purpose and for detailed competition selection should receive due consideration with a view to obviating the possibility of either method becoming discredited in the eyes of the practical producer.

Signed: *H. R. DAVIDSON; JOHN HAMMOND; JOS. B. SWAIN.*

In spite of wartime difficulties New Zealand has made great efforts to maintain the high quality of her products and where possible to improve them. Special interest has been taken by producers and the trade in producing bacon pigs suitable for the United Kingdom trade, and it was for this reason that competitions were held throughout the war.

In the past it would seem that bacon curers in Great Britain have been prejudiced against frozen baconers, preferring to pay substantial premiums for fresh home-produced or Danish pigs. As Great Britain is as yet the only outlet for New Zealand pigs, every effort should be made to demonstrate to important curers there that New Zealand frozen carcasses of improved quality can be processed into bacon that will satisfy the taste of even the most fastidious consumer.

Bacon Curers' Comment

Accordingly the display of 100 prize-winning pigs was held at the Union Cold Storage Company, London, on October 14, 1945. After the display, at which the carcasses were viewed by bacon curers invited to attend from all over Great Britain, arrangements were made by Messrs. W. Weddel and Company for the carcasses to be distributed among the curers for manufacture into bacon and for further comment. Reports on these carcasses came back from as far afield as Newcastle-on-Tyne, Carlisle, Wiltshire, and Staffordshire, and, of course, many from London.

They are interesting and informative and should give encouragement to New Zealand producers.

Finish:

There was a good proportion of lean meat, but the pigs were rather thin on the belly. Thinness of belly or steaky part is a serious defect in a side of bacon, and a little more fat could be carried with advantage. Some of the shoulders could be improved and some sides lacked compactness.

Weight Range:

The ideal weight for bacon pigs is 140lb. to 160lb. The bacon from pigs under this weight has, in normal times, to be sold at a discount.

Butchering:

The dressing and butchering were excellent and the absence of blemishes on the carcasses indicated that these pigs must have been well handled before slaughter.

General:

London—"These test sides were obviously far above the normal run of imported New Zealand sides and are, we think, indicative of further improvement that can be made."

Wiltshire—"We found all 20 pigs to be exceptionally good and it was not very easy to determine which were the best sides. Our general conclusion is that the whole batch was an excellent turnout and most suitable for the English market."

Stafford—"They were full of flesh and the hams well filled right down to the hocks. They were of good length and the fore-ends were light."

Carlisle—"Apart from the fact that a good many were rather light weight for bacon, they were all excellent bacon pigs and every curer would be able to turn out good bacon given carcasses of this description."

Newcastle-on-Tyne—Lot 314, grand champions of the competition, were sent to the Empire Bacon Company, Newcastle-on-Tyne, whose report, being of special interest, is given in full:—

A. Length of side: Good, bearing a good proportion of lean to fat and of meat to bone.

Ham: Plump, wide, and deep to the back.

Fore-end: Not out of proportion to the side; good steak reasonably thick.

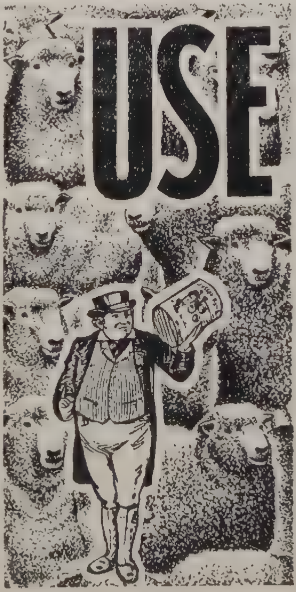
Fat: Quality and texture firm and good. Flesh or meat tender.

Skin: Fine, free from scratches and bruises of any kind. Good lean sides of bacon.

B. Flavour: After curing, rashers were cut from Lot 314 and fried. Four persons not knowing from which lot the rashers had been cut all agreed in favour of Lot 314 as being tender and of excellent flavour.

TOTAL CROP ACREAGE

The total crop acreage in New Zealand for the 1944-45 season of 2,010,300 measures up well to the record crop acreages of the 1940-41 and 1941-42 seasons—2,048,200 and 2,010,600 respectively. Some of the areas of crops (excluding boroughs, etc.) harvested last season, with corresponding figures for the previous season in parentheses, are: Wheat threshed, 183,900 acres (233,800); oats threshed, 77,700 acres (39,700); barley threshed, 37,300 acres (28 200); maize threshed, 8,500 acres (5,700); peas threshed, 44,000 acres (44,700); beans threshed, 500 acres (300); potatoes, 29,800 acres (27,200); onions, 1,900 acres (1,000).



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TOP-WORKING UNDESIRABLE VARIETIES OF CITRUS

By P. EVERETT, *Orchard Instructor, Kaikohe.*

IN many citrus orchards there are a few trees of varieties unlikely to prove successful commercially. This applies particularly to grapefruit such as Marsh, Foster, Duncan, and Triumph, varieties with which, in the New Zealand climate, high quality cannot be achieved.

THE reworking of such trees to more suitable varieties of grapefruit, or to some other kind of citrus, would be in the best interests not only of the growers themselves but of the industry as a whole.

Although at times during periods of short supply there are satisfactory prices for poor-quality fruit, maintenance of these prices cannot be expected as local production increases and as supplies from overseas again become available in quantities sufficient to meet the requirements of consumers. The marketing of poor-quality New Zealand-grown fruit also has an adverse influence on the market prices of good-quality fruit, to the detriment of the citrus industry generally and to the individual growers concerned, particularly.

Suitable Trees

Lemon, orange, grapefruit, and lime trees may usually be successfully reworked to any citrus desired, provided the trees are healthy. Grapefruit and orange trees are especially suitable for top-working to other varieties.

In reworking citrus, usually it is not necessary to head back trees for the purpose of developing young growth to receive the buds. In old trees, however, this is sometimes desirable. Buds may readily be inserted into limbs up to 1in. in diameter. Most trees have branches of this size or smaller adequate for the purpose, branches which are suitably spaced to provide a good framework for the new tree. It is neither necessary nor desirable for buds to be inserted near the main fork, except with very young trees.

Old trees which have insufficient branches suitable for budding into should be headed back to about 3ft. above ground level, with the lower limbs left intact. Best time for this work is in September. New growth should be thinned out in the summer; selected shoots which, when budded, are sufficient to refurnish the tree with new branches should be left.

Citrus may be budded at any time when the trees are growing freely, but the best results are obtainable from buds inserted in the autumn. Buds for propagation should be selected from rounded, more-or-less horizontal growth made during the previous autumn. As soon as the bud-wood has been selected the foliage should be removed to prevent loss of moisture through transpiration. The bud-wood should be wrapped in a wet cloth until required.

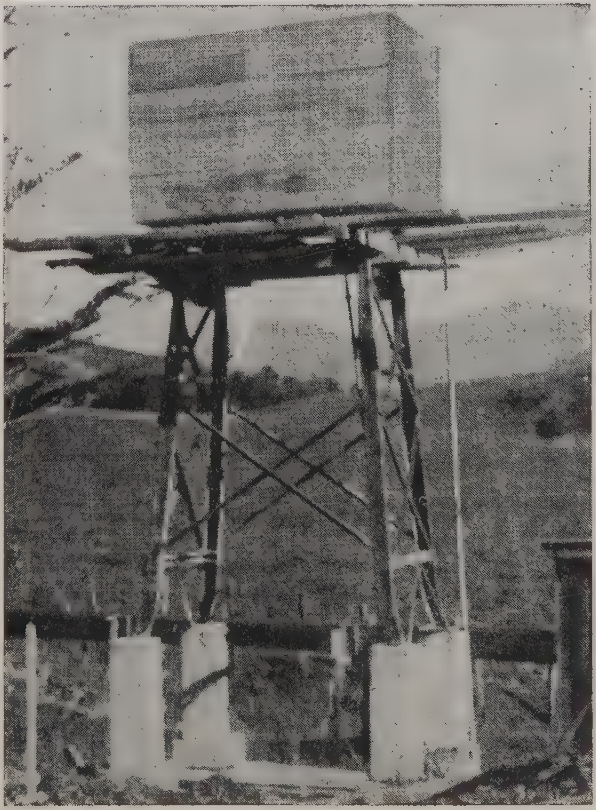
Trees 5ft. high or taller are best budded about 3ft. above the ground and about 2ft. from the centre of the tree. Assuming that all buds "take," the number required for reworking mature trees is about eight, and for smaller trees from four to eight. However, as some buds usually fail, about 50 per cent. more buds than are needed should be inserted.

Young Branches Needed

Just before trees are budded they should be pruned by removing all branches and twigs likely to hinder the work of the operator. Further cutting back of the tree should be delayed until the spring. Branches to be budded should be as young as possible, but at least the thickness of a lead pencil. They should be suitably spaced to make a uniform tree. New growth developing from trees headed back in the spring should be suitable for budding the following autumn.

Trees budded in the autumn should be cut back to within 8in. of the bud when spring growth starts and there is no further danger of frost. To cut back close to the buds is inadvisable as sap in the wood left above affords them nourishment and the wood itself serves as a support to which shoots may be tied for protection from wind damage. The stump above the bud should not be allowed to make any growth and should be cut off as soon as the shoots are strong enough to support themselves. Shoots emerging from the limbs and any remaining branches should not be removed immediately, but should be thinned and headed back for two seasons, until the branches arising from the bud-wood are well-established.

Tankstand from Truck Chassis



YET another use for old car or truck frames is illustrated in the accompanying photograph. Suitable discarded chassis are obtainable from motor-wrecking firms, and have been widely used for the construction of small bridges over farm ditches or streams.

Few, perhaps, would have thought of using them in building a tankstand, especially one mounting a home-made concrete tank. Yet such structures will endure long after the usual wooden tankstand and corrugated iron tank have decayed.

—*D. M. MERRY, Instructor in Agriculture, Nelson.*

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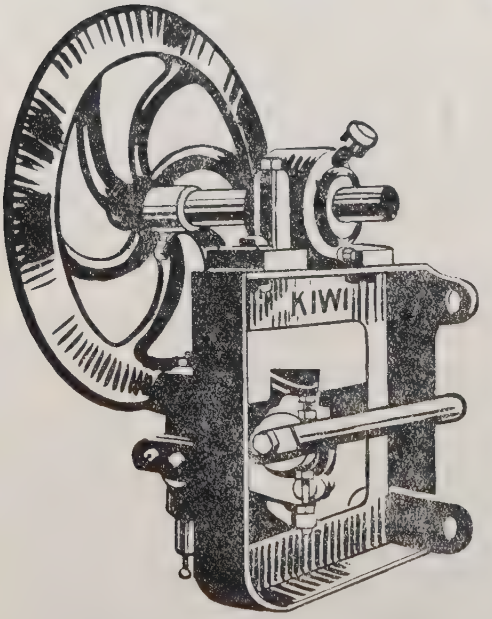

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PASTURE TOPDRESSING

Experiments in Northern King Country

THE observational pasture topdressing experiments reviewed in this article by K. M. Montgomery, Fields Instructor, Te Kuiti, were conducted in that portion of the northern King Country covered by the Waitomo, Otorohanga, and southern portion of the Kawhia Counties. Prior to 1930 the effects of pasture topdressing were ascertained principally by haying experiments, and while this type of experiment yielded valuable information, its usefulness was limited by such factors as the time and labour requirements to gain the information, the small number of trials which could be laid down in any one district, and the limited range of soil types on which the trials could be laid down, while the results represented only six to eight weeks' growth, and did not as a rule deal with quality of the herbage.

WITH the rapid increase of the use of artificial fertilisers for pasture topdressing, it became obvious that this type of experiment would have to be replaced by one which could be laid down on all soil types and contour of land. Where "observation" of effect of treatments is all that is required, small plots have a very decided advantage over large ones for the following reasons: (1) A uniform sward can be selected on which to lay down the plots; (2) on account of their close proximity to one another treatments can be compared readily; (3) where treatments affect palatability, as evidenced by different intensities of grazing by stock, such effect is just as clearly marked on plots of a few yards square as when plots are several chains or acres in extent; (4) where a manure-response survey is being conducted a very large number of experiments can be laid down with a comparatively small expenditure of money and time; (5) a large number of small experiments serve the interest of a greater number of farmers than do a few large-scale ones.

Crushing out fern by cattle prepares the way for the establishment and maintenance of good pastures by topdressing.

Reversion to manuka may be prevented to a large extent by topdressing with phosphate and carrying a higher concentration of stock.

In the observational topdressing trials the responses were recorded under a pointing system as follows:—

0 No visible response
? Doubtful response
1 Slight response
2 Fair response
3 Good response
4 Very good response
5 Excellent response

The first type of observational topdressing experiments were the L.P.K.N. (these initials standing for lime, phosphate, potash, and nitrogen)—see Journal of Agriculture, November, 1930, page 327—and seven of these were laid down in the aforementioned area as follows:—

Experiment No.	Name of co-operating farmer.	District.	County.
16/1/170	H. Gall,	Puketarata	Otorohanga
171	E. Tolme,	Aria	Waitomo
172	H. A. L[illegible]man,	Rangiatea	Otorohanga
173	H. E. Walters,	Ngahape	Otorohanga
174	J. J. Walker,	River Road	Otorohanga
186	M. A. MacKenzie,	Wairere	Waitomo
187	M. L. Coogan,	Mokauiti	Waitomo

The initial dressing of lime (L) was applied at the rate of 1 ton per acre with 5cwt. per acre annually; superphosphate (P) 3cwt. per acre annually; 30 per cent. potash salts (K) 2cwt. per acre annually; and nitrogen (N) 1cwt. per acre of sulphate of ammonia in the early autumn.

TABLE 1—Summary of 5 years' Observations of Responses to Treatments

Trial No.	P	K	P & K	L	L & P	L & K	L & P & K	N
170	2	?	2	1	2½	1	3	2
171	1	?	1	1	2	1	2	?
172	2	?	2½	1	3	1	3	?
173	2	0	2	?	2½	?	2½	1
174	2½	?	2½	1	3	1½	3½	1
186	1	0	1	1	2	1	2½	0
187	2½	1	2½	1	3	1	3½	0

Comments on Responses

Lime: Only one experiment failed to give a noticeable response from lime.

Superphosphate: Only two cases are recorded where superphosphate did not give a fair response. Both of these trials were situated where fertility was already high, and on high-fertility soils responses have to be much greater to be visible than on low-fertility soils.

Potash: These results indicate that potash is not a serious limiting factor so far as production of herbage is concerned.

Nitrogen: After two dressings of sulphate of ammonia had been applied further dressings were discontinued, as it was found that the pastures generally were not of a sufficiently high standard to warrant the use of this fertiliser. The use of a nitrogenous fertiliser as a pasture topdressing is not generally warranted unless the sward contains a high proportion of ryegrass, cocksfoot, and white clover of a permanent strain.

Experience throughout New Zealand with this type of experiment had revealed that the area of pasturage which warranted the use of nitrogenous fertilisers was relatively small and the responses from lime and superphosphate had been so general that it was decided to continue with a modified form of this experiment less the use of nitrogen. These new trials were referred to as L.P.K. trials.

Seven of these L.P.K. observational experiments were laid down as follows:—

Experiment No.	Name of co-operating farmer.	District.	County.
16/1/322	J. Hobson,	Pio Pio	Waitomo
323	G. Anselmi,	Waikawau	Waitomo
324	J. Collins,	Aria	Waitomo
325	A. G. C. Luxmore,	Kio Kio	Otorohanga
327	H. E. Walters,	Ngahape	Otorohanga
328	T. Snowdon,	Te Kuiti	Waitomo
335	A. L. Marsh,	Troopers Rd.	Waitomo

It was intended that the duration of these trials should be 4 years or longer, but unfortunately some of them were kept under observation for only short periods, as they had been nullified, principally through hired labour topdressing the plots along with the balance of the field. In the table of results the number of years each trial was under observation is shown in brackets alongside the experiment number.

TABLE 2—Summary of Observations of Responses on L.P.K. Experiments.

Trial No.	P	K	P & K	L	L & P	L & K	L & P & K
322 (1)	2	0	2	1	2½	1	2½
323 (3)	2½	0	2½	1½	4	1½	4
324 (1)	2½	0	3	1	3	1	3
325 (5)	3½	?	4	0	5	1	5
327 (3)	3	0	3½	?	3½	1	3½
328 (1)	2	1	3	1	2	2	3
335 (5)	2½	0	2½	1	3	1½	3

Comments on Responses

Lime: Only two trials failed to show a response to lime alone, but when combined with superphosphate the response was better than with superphosphate alone.

Superphosphate: All trials showed a "fair" to "good" response from superphosphate, and in six trials there was a better response when it was combined with lime than when used alone.

Potash: Comments as for table 1.

The L.P.K.N. and L.P.K. trials had shown that over the greater part of the northern King Country phosphate was the limiting factor in pasture growth and the addition of lime produced a more evenly-balanced ryegrass-white clover pasture. In districts where lime was difficult to obtain and/or cartage costs were considered too high for its economical use, basic slag was often used in preference to superphosphate.

It was therefore decided to test out the relative responses of basic slag (Sg.) compared with superphosphate. In conjunction with members of the Te Anga Central Young Farmers' Club, six trials were put down in the southern portion of the Kawhia County as follows:—

Experiment No.	Name of co-operating farmer.	District.
16/1/549	Mrs. Derecourt	Te Anga
550	G. Gordon	Awamarino
551	Miln Bros.	Awamarino
552	S. N. Vicary	Marakopa
553	S. N. Vicary	Marakopa
554	J. P. Wright	Kinohaku

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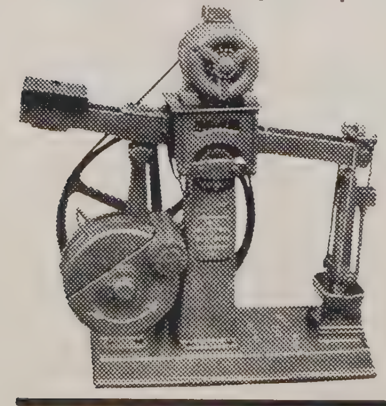

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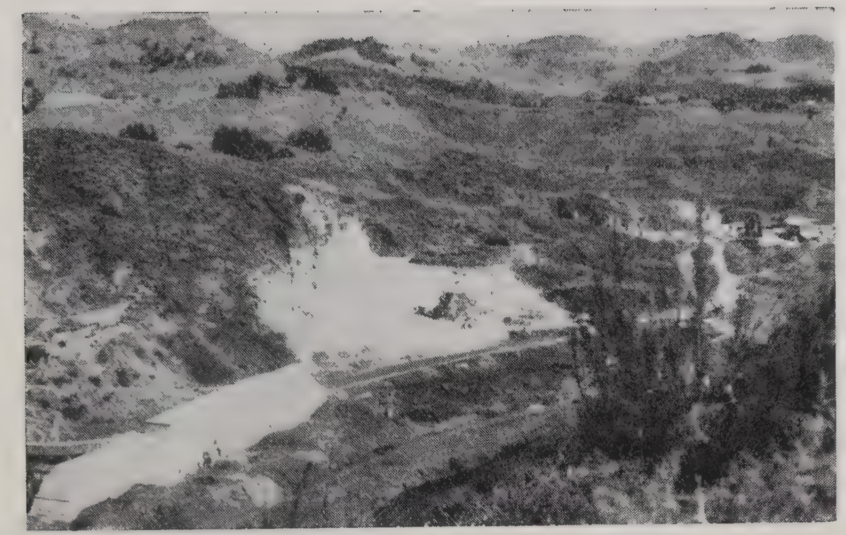

Soils in the Northern King Country respond to the application of lime. Limeworks in the Waitomo County produce about 175,000 tons per annum.

Experiments Nos. 549, 550, 553, and 554 were all on hillsides, 551 on a drained white pine swamp badly infested with pennyroyal, and 552 on a "fan" built up from materials which had come down from the surrounding hillsides when the country first settled down. Nearly all the trials were laid down on pastures which in the past had had little or no fertiliser, and responses were noticeable within a few weeks of application. In this series of experiments there is no "lime alone" plot.

TABLE 3—Summary of 4 years of Observations of Responses.

Trial No.	P	K	P & K	L & P	L & K	L & P & K	Sg.	L & Sg.	Sg. & K	L & Sg. & K
549	4	1	4½	4½	1	5	4	4½	4½	5
550	3	0	4½	4½	1	5	3	4	4	4½
551	3	1	4	4	1½	5	2	3	3	4
552	2½	1	3½	4½	3	5	3	4½	4	5
553	2½	1	3½	3	1	4	1	1½	3	3½
554	3	0	3½	4½	1½	5	2½	3½	3	4

Comments on Responses

Superphosphate: All trials showed a good response from superphosphate, and in three trials it was better than slag.

Slag: Four trials gave a good response, but only 1 trial was superior to superphosphate.

Superphosphate and lime: All trials gave a "good" to "very good" response; in every case it was superior to superphosphate alone, and in four trials it was superior to slag and lime.

Slag and lime: In five trials a "good" to "very good" response was obtained, and in every case it was superior to slag alone, but in no trials was it superior to superphosphate and lime.

Potash: In four trials a slight response was observed from the use of potash alone. However, in all trials, when used in combination with superphosphate, or slag, or lime and superphosphate, or lime and slag a greater response was noted than from those fertilisers alone. This potash response was noticeable in the increased clover density and preference of grazing.

Experience throughout the Dominion generally had shown that to obtain reliable responses from nitrogen and potash it is essential that the trials should be conducted on pasture containing a reasonably high percentage of good type perennial ryegrass and white clover. In addition to gaining information on nitrogen and potash responses, some information was also sought as to the relative value of different phosphatic fertilisers for pasture establishment and maintenance. It was decided that some trials should be laid down on good pasture, and the Department supplied approved seeds for sowing some areas. Four areas were sown with a special mixture consisting of:—

	Per acre.
Italian ryegrass	5lb.
Cert. perennial ryegrass .	25lb.
" cocksfoot (Akaroa) .	10lb.
" P.P. white clover ..	3lb.
Montgomery red clover ..	3lb.
Total	46lb. per ac.

The trials were situated as follows:—

Experiment No.	Name of co-operating farmer.	District.	County.
16/1/355	H. A. Lurman,	Rangiatea	Otorohanga
480	J. Hobson,	Pio Pio	Waitomo
482	H. E. Walters,	Ngahape	Otorohanga
513	A. Henderson,	Kio Kio	Otorohanga

Readers who are familiar with the northern King Country will appreciate that these areas include some of the better class of land and are representative of a fairly large proportion of country in their respective situations; consequently the responses can be accepted as indicating what could be expected from topdressing a good pasture within those areas.

This country was previously a waste of fern. It is now carrying good pasture as the result of phosphatic topdressing following crushing, ploughing, and sowing down with certified seeds.

MORE DAIRY COWS IN MILK

There were 4,628,000 head of cattle in New Zealand at January 31, 1945, 152,000 more than in the previous year, and only 14,000 fewer than the record number in 1942. A pleasing feature is that dairy cows in milk show an increase over the previous year of 31,000, while the numbers of beef cattle and of dairy heifers have also increased.

TABLE 4—Summary of 5 years of Observations of Responses.

Fertiliser.	Experiment No. 355	480	482	513
Super. (P)	3	2	2½	2½
Potash (K)	1	0	0	1
Super. & Potash (P & K)	4	2½	4	4
Lime & super. (L & P)	4	3	4	3½
Lime & potash (L & K)	1	1	1	2
Lime & super. & potash (L & P & K)	5	3½	4	4½
Slag (Sg)	3	2½	3	2½
Slag & potash (Sg & K)	4	2½	4	3½
Lime and slag (L & Sg)	3½	3	4	3
Lime & slag & potash (L & Sg & K)	4½	3	4	4
Seychelles (Sey)	2	1	1½	1
Lime & Seychelles (L & Sey)	2½	1½	2	1½
Ammoniated super. (AS)	2½	2	2	1½
Lime & Ammoniated super. (L & AS)	3	2½	3½	2½

Comments on Responses

Superphosphate: All trials showed a "fair" to "good" response from superphosphate.

Slag: All trials showed a similar response to superphosphate and in two trials it was superior to superphosphate. This slight improvement is accounted for by the ract that these trials were laid down on soil types which are known to be relatively high in "phosphate fixation" properties; a citric-soluble phosphate such as basic slag will be less affected than would a water-soluble one like superphosphate.

Lime and superphosphate: All trials showed a "good" to "very good" response, and in all trials was superior to superphosphate or slag, while in two trials it was better than lime and slag.

Lime and slag: In all trials it was slightly superior to slag alone, and in two trials equal to lime and superphosphate.

Seychelles and lime and seychelles: These trials showed that a slow-acting phosphate is not as responsive on these soil types as the more readily available phosphates such as superphosphate or slag.

Potash: These trials revealed that on a pasture of good constituency potash is not a limiting factor as far as pasture establishment and production are concerned. but its use in combination with available phosphate and lime is warranted where a pasture contains a good proportion of white clover. It is interesting to note that potash plots on a dampish situation were much more responsive than those on a drier location.

Ammoniated superphosphate: Over the whole period very little difference from superphosphate or lime and superphosphate is recorded. However, the figures as shown in the summary do not reveal the true picture as far as nitrogen is concerned. It is not to be expected that with one application per annum of ammoniated superphosphate a relatively higher production can be obtained for 12 months of the year. Nitrogen should be used for a specific purpose, i.e., production of "out of season" herbage, and while many farmers tend to condemn applications of artificial nitrogen, these trials have shown that provided the land is well supplied with lime and phosphates, very little deterioration of the pasture results from the use of artificial nitrogen.

Imported basic slag has always been held in high esteem for topdressing, particularly by the hill-country farmer, who contended that there was nothing like basic slag to improve the hill pasture. With the introduction of New Zealand produced slag, referred to as "Heskett slag," it was decided to compare this product with superphosphate, imported basic slag, and in later trials with serpentine superphosphate. In the summary below it will be noted that the trials vary in the treatments used and have been brought into the one table for convenience of tabulating. The trials laid down are as follows:—

Experiment No.	Name of co-operating farmer-	District.	County.
16/1/852	W. I. Hunt,	Te Kuiti	Waitomo
855	W. J. Dimond,	Manga-orongo	Otorohanga
1020	D. B. Millward,	Kio Kio	Otorohanga
1021	A. G. C. Luxmore,	Kio Kio	Otorohanga
1030	Land Development Dept.,	Hill's Blk.	Otorohanga
1095	R. Boddy,	Paemako	Waitomo
1105	G. C. Miln,	Mairoa	Waitomo

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Phosphatic topdressing has been the main factor in the conversion of much fern country into good dairying land.

TABLE 5—Summary of Observations.

Fertiliser.	853	855	1020	1021	1030	1095	1105
			Trial Nos.				
Super.	2½	2	2½	3½	3	3	3
Basic slag	3	3	3	4	4		
Lime & super.	4½	3½	4	4½	4½	4	4
Lime & slag	4	3½					
Heskett slag	1	?	1½	2	1½		
Lime & Heskett slag ..	2½	1					
Serpentine super. ..			3	4	3½	2½	3
Lime & serpentine super.						3½	3½

In trials 1095 and 1105 Gafsa, a North African phosphate, and Nauru were also used, but the responses from these slow-acting phosphates were only just noticeable and coincided with the results of former trials with slow-acting phosphates.

Comments on Responses

Superphosphate: A "fair" to "good" response was obtained from superphosphate in all trials.

Basic slag: A "good" to "very good" response was obtained in all trials and was better than superphosphate in those trials where the comparison was made (see comments on responses noted in table 4).

Lime and superphosphate: A "very good" response was recorded on all trials and was better than superphosphate, slag, or lime and slag in all trials except one.

Lime and slag: In the two trials where this was used it was superior to slag or superphosphate alone, and in one trial was equal to lime and superphosphate.

Heskett slag: In all trials only a "slight" to "fair" response was recorded.

Lime and Heskett slag: This is disappointing considering the chemical nature of the fertiliser and the high "phosphate fixation" soil types on which the trials were conducted. Farmers in the back country where the rainfall is higher than those areas where the trials were conducted have expressed their satisfaction with this fertiliser, and investigational work in these districts would be necessary to test the suitability of Heskett slag under high rainfall conditions.

Serpentine superphosphate and lime and serpentine superphosphate: All trials showed a "good" to "very good" response and in four trials was better than superphosphate, but even with the addition of lime it was not equal to lime and superphosphate. Further investigations in the use of serpentine superphosphate were interrupted by the war. In view of the controversy over serpentine superphosphate versus superphosphate this work is to be put in hand at an early date. However, farmers' opinions are worthy of note. One hears much condemnation of serpentine superphosphate, but the writer has frequently been told that although superphosphate is now available, farmers are still ordering serpentine superphosphate in preference.

Conclusion

Reviewing the work over the past 14 years, when "observational" topdressing trials were substituted for the haying experiments, the following conclusions have been arrived at:—

1. **Lime:** In general terms, the whole of the northern King Country is responsive to lime, but it is not a limiting factor in pasture growth. When added to superphosphate a greater response is obtained than from superphosphate alone, and this is reflected in a better grass and clover sward. Statistics reveal that the Waitomo County—the premier lime-producing district of the North Island—uses less than ½cwt. per acre per annum on its sown grasslands, but while delivery charges are at a high level there is little prospect of a greater use of this material so essential for good pastures and healthy stock.

2. **Phosphates:** All trials showed that phosphate, whether it be superphosphate, serpentine superphosphate, or imported basic slag, is the limiting factor in increased pasture growth. Response to phosphate is reflected in an increased clover growth. To grow good grass it is essential that it be supplied with nitrogen, and clovers are the cheapest and best medium throughout the year by which nitrogen can be made available to the grasses. The economical use of slow-acting phosphates is problematical.

3. **Potash:** The trials showed that over the areas under investigation potash is not a limiting factor in pasture production, but on high-quality pasture its use in conjunction with phosphates produces a stronger white clover pasture than phosphates or lime and phosphates. Although the trials did not reveal any really potash-deficient areas, a small peaty area adjoining the Waipa River in the Otorohanga County where potash was definitely the limiting factor in pasture establishment and growth was found. Prior to the use of 2cwt. per acre of 30 per cent. potash salts on this area, the pasture, in spite of liberal applications of lime and phosphates, was of a relatively low butterfat-producing quality. It was very open, as white clover had failed to establish, and the ryegrass was of a spindly nature due to lack of nitrogen. The first dressing of potash salts resulted in a complete transformation, and when last visited about two years ago these pastures were as productive as much of the best in the county.

4. **Nitrogen:** In the relatively small amount of work performed it has been shown that artificial nitrogen will produce an "out of season" grassy sward, and when the pasture is topdressed with lime and phosphate the clover content of the pasture is not seriously impaired. It must be recognised that artificial nitrogen should be used for production of grass in the colder parts of the year, where bacteria in the soil which make nitrogen, gathered and stored by the clovers, available for the grasses are comparatively inactive.

MOLE DRAINAGE.

Mole drainage is an economic and efficient method of drainage under certain conditions. Complete directions, together with practical experiences, are given in Bulletin No. 170, "Mole Drainage," which is obtainable from offices of the Department of Agriculture.

INEXPERIENCED ORCHARD STAFFS NEED ADEQUATE INSTRUCTION

By A. R. GRAINGER, Orchard Instructor, Christchurch.

PRINCIPAL activities of orchardists in March are harvesting, grading, packing, and storing fruit. While late-maturing peaches and plums have to be dealt with, apples and pears need the most attention.

SINCE experienced orchard labour is not always available to handle the larger quantities of fruit in late February or early March, owners or orchard managers taking on extra labour should see that their employees get adequate instruction in efficient handling.

Inexperienced employees may, with advantage, start work a few days before the rush period begins. This will provide an opportunity for them to learn their duties.

On a large orchard the staff may consist of specialised operators—pickers, graders, packers, nailers-up and labellers—but the training of understudies should be kept in view for, in a busy season of eight to ten weeks, there is always a likelihood of absentees through sickness.

Supervisor's Duties

Altogether the supervisor has most important work to perform. He must:

(a) Inspect all equipment for efficiency, soundness, and safety in use. Not only must machinery be rendered safe, but the staff must be taught to handle it correctly;

(b) Supervise pickers to see that fruit is removed from the tree in the proper way and that it is handled carefully through all stages from tree to inspection point. See that picked fruit is kept out of the hot sunshine which usually prevails for the greater part of the harvesting season;

(c) Watch graders and frequently check over the fruit in the bins;

(d) Watch packers to see that the fruit is handled correctly, that layers are finished at the correct height and, particularly, that no low packs are sent to the nailer-up, and that the fruit at the ends of the box is not too high. Check the count marked on the case;

(e) Watch nailer-up to see that lidding is done correctly with no nails protruding;

(f) Watch stacking and labelling to see that the cases of the respective grades of fruit are kept separate and that the branding is correct and neat;

(g) See that the submit note covering consignments is clearly and accurately made out in all copies required and that loading-out is done carefully, without undue jarring of the fruit;

(h) See that grading is regulated so that packers can cope with their work without continually having to work with overcrowded bins. These are liable to cause grader marking of the fruit;

(i) See that rubbish such as fruit spurs, twigs and foliage is regularly removed from the bins and also provide for the cleaning of shed and equipment at least daily;

(j) See to adequate personal facilities for the staff;

(k) Regulate the picking of varieties at the correct stage of maturity. See to grading and packing without delay. It should be noted that holding varieties of apples which mark readily, such as Sturmers, for a day or two before packing is advisable to eliminate grader marking; and

(l) See that fruit submitted for long cool-storage is picked, packed, and despatched without delay. See that pears are no longer than 48 hours from tree to inspection point. Picking and packing the same day should be the objective.

"Supervision" is most important in the harvesting season. It can be claimed, with justification, that most of the degrading and rejection of fruit at the inspection point can be traced back to lack of efficient supervision.

Grading and Packing

Demonstrations and lectures on grading and packing are given by local orchard instructors at convenient points in fruit-growing areas. Growers should watch for an intimation concerning these demonstrations, as the latest information is then made available. Those desiring a personal visit for advice on their own problems should make immediate application.

Apple- and pear-picking charts for the No. 1 and No. 2 standard case respectively are reproduced on this page.

◆

STANDARD PACKAGE FOR FRUIT (No. 2)

Inside measurements 8½ x 11½ x 18in.

PEAR-PACKING CHART

	Style of pack (cross-wise)	No. in rows (length-wise)	No. of tiers (depth)	Count	Approximate Size
Round Varieties	3 — 2	4 — 3	4	70	3¼″
	3 — 2	4 — 4	4	80	3⅛″
	3 — 2	5 — 4	4	90	3″
	3 — 2	5 — 5	4	100	2⅞″
	3 — 2	6 — 5	4	110	2¾″
	3 — 2	6 — 6	4	120	2¾″
	3 — 3	4 — 4	5	120	2¾″
	3 — 2	7 — 6	4	130	2⅝″
	3 — 3	5 — 4	5	135	2½″
	3 — 3	5 — 5	5	150	2½″
	3 — 3	6 — 5	5	165	2⅜″
	3 — 3	6 — 6	5	180	2¼″
	3 — 3	7 — 6	5	195	2¼″
	3 — 3	7 — 7	5	210	2⅛″
	4 — 3	6 — 6	5	210	2⅛″
	4 — 3	7 — 6	5	228	2″
Elongated Varieties	3 — 2	4 — 3	4	70	3″
	3 — 2	4 — 4	4	80	2⅞″
	3 — 2	5 — 4	4	90	2¾″
	3 — 3	4 — 3	5	105	2⅝″
	3 — 2	6 — 5	4	110	2⅝″
	3 — 3	4 — 4	5	120	2½″
	3 — 3	5 — 4	5	135	2½″
	3 — 3	5 — 5	5	150	2⅜″
	3 — 3	6 — 5	5	165	2¼″
	3 — 3	6 — 6	5	180	2⅛″

STANDARD PACKAGE FOR FRUIT (No. 1)

Inside measurements 10½ x 11½ x 18in.

APPLE-PACKING CHART

Style of pack (cross-wise)	No. in rows (length-wise)	No. of tiers (depth)	Count	Approximate Size
2 — 1	4 — 4	3	36	4″
2 — 1	5 — 4	3	41	4″
2 — 2	3 — 3	4	48	3⅞″
2 — 2	4 — 3	4	56	3¾″
2 — 2	4 — 4	4	64	3⅝″
2 — 2	5 — 4	4	72	3½″
2 — 2	5 — 5	4	80	3⅜″
2 — 2	6 — 5	a4	88	3¼″
3 — 2	4 — 3	b5	88	3¼″
2 — 2	6 — 6	a4	96	3″
3 — 2	4 — 4	5	100	3″
3 — 2	5 — 4	5	113	2⅞″
3 — 2	5 — 5	5	125	2¾″
3 — 2	6 — 5	5	138	2¾″
3 — 2	6 — 6	5	150	2⅝″
3 — 2	7 — 6	5	163	2⅝″
3 — 3	5 — 4	6	162	2⅝″
3 — 2	7 — 7	c5	175	2½″
3 — 3	5 — 5	d6	180	2½″
3 — 3	6 — 5	6	198	2⅜″
3 — 3	6 — 6	6	216	2⅜″
3 — 3	7 — 6	6	234	2¼″
3 — 3	7 — 7	6	252	2⅛″
3 — 3	8 — 7	6	270	2⅛″
3 — 3	8 — 8	6	288	2″

a—for flat apples. b—for long apples.
c—flat apples only. d—all apples.

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AUTUMN WORK IN HOME GARDENS IS IMPORTANT

By D. K. PRITCHARD, *Instructor in Vegetable Culture, Wellington.*

WHEN crops in the home garden have been harvested it is advisable—especially in districts where it is too late to obtain a "catch" crop before winter—to clear away all plant residues and turn the soil over.

[*Sparrow Industrial Pictures photo.*

Remove and destroy by burning all diseased plant residues.

DIGGING during autumn may have two objects—either preparation for sowing seed of a green-manure crop or for exposure of the soil to the influences of winter weather, rain, frost, and, possibly, snow, which are beneficial to all soils, especially those of heavy texture. A flat surface should not be exposed. As digging is being carried out, the soil should be thrown up in ridges and allowed to remain in a rough condition without being broken down. This exposes the soil to "weathering," a procedure which assists future digging and planting.

If seed for a green-manure crop is to be sown, 1oz. to 2oz. of blood and bone manure per square yard may be applied over the appropriate area and worked into the soil before the seed is broadcast. For production of organic matter only, oats may be sown. Where more nitrogen also is needed in the soil, seed of a leguminous crop may be chosen. Lupins are suitable. As a green-manure crop, lupins supply organic matter in addition to nitrogen.

Onions

March is the month in which the onion crop is usually harvested. When bulbs are properly ripe they should be removed without delay. Dry, windy weather is ideal for harvesting the crop. Well-grown, early-planted onions which, by this time, have completed their growth, may be removed quite easily as their roots have almost lost grip of the soil. When pulled, the bulbs should be gathered together, but not in a heap. Set in a double row, with the bulbs facing each other, the tops will not interfere with the drying process.

Unless the soil is particularly dry, bulbs should be placed on a verandah or on a garden path. A verandah is excellent for a small crop. After drying for three or four days the roots and tops may be removed and the bulbs stored in a cool, dry shed or other suitable building where there is good air circulation.

Stringing is excellent for keeping well-grown onions of a small home-garden crop in good condition. Stringing may be done only by retaining the tops, twisting them round stout string or wire, and hanging them in one of the buildings previously mentioned.

Potatoes

Although, during March, there may be little time to spare for routine garden work, attention to the main potato crop is necessary. Weed control should be rigorous. When hoeing, it is advisable to draw additional soil from between the rows to keep the developing tubers covered. Covering the potatoes affords protection from the tuber-moth which lays its eggs in the eyes of exposed potatoes. This is the principal reason for "banking" the rows of potatoes with soil. Spraying the tops, also, is important. Home-made Bordeaux mixture is recommended.

[*Sparrow Industrial Pictures photo.*

Lupins or other leguminous crops sown now may be dug in later to make humus and add nitrogen to the soil.

Kumaras

Although kumaras are relatively immune from disease the crop should not be neglected. In dry weather the foliage may be attacked by leaf-destroying insects. Serious results may be prevented by spraying with nicotine sulphate or arsenate of lead. The former, which for home-garden use is usually sold in 1oz. bottles, should be used according to the directions of the manufacturer. Arsenate of lead in powder form may be mixed with water, 1oz. to 2 gallons. Most economical method of application is to mix the arsenate of lead with Bordeaux which must be used for spraying tomatoes. When the mixture is being made up for tomatoes sufficient may be added for spraying the kumaras.

Cabbage (winter)

In dry districts during late February and early March, the development of savoy cabbage for winter harvesting may be retarded by inadequate watering or by damage from caterpillars of the white butterfly and diamond-back moth. For fully-grown heads, which will remain in good condition throughout the winter, the plants should be kept well supplied with water, the amount of which depends on the situation and the district in which the plants are growing. The caterpillars may be destroyed with nicotine sulphate or derris. The latter can be used either as a dust or spray. If needed as a spray, the person from whom the derris is bought should be advised, as the spray preparation differs in composition from derris dust.

Cabbage (spring)

Seedlings from early sown seed of spring cabbage should be kept growing steadily. As these delicate plants are ready victims of aphides, they must be closely watched and kept well sprayed. Nicotine sulphate or derris may be used with safety on young cabbage seedlings, as can Paranaph, the formula for which appeared on page 83 of the January issue of this Journal. Spring cabbage plants should not be set out until conditions are cool. Aphis control is easy in the seed-bed. It may be difficult and much more costly when plants are set out.

Tomatoes

Well-grown tomato plants should now be giving a good supply of fruit. When, as should be expected, the bottom truss soon disappears, removal of the main bottom leaves may be advisable. These should be examined for the disease septoria leaf spot, which may be easily recognised by the appearance on the leaves of numerous small yellowish-brown spots. These gradually merge together, turn brown, and ultimately cause death of the leaf. Diseased leaves, when removed, should be burned.

Spraying tomato plants with Bordeaux mixture is most important from now to the end of the season. When half the fruit has been picked from the plant it should not be assumed that further spraying is unnecessary. If foliage and fruit are to be kept healthy in late autumn humidity, spraying should not be neglected. Proper spraying will prolong the life of the plant and protect fruit and foliage from late blight.

Celery

Under favourable conditions celery plants should make good growth during March. Close observation is necessary to detect signs of loss of vigour which may be due to the soil being too dry, or to one or both of the diseases mentioned as affecting tomatoes. These diseases in celery may be effectively treated the same way as in tomatoes. Spraying with Bordeaux mixture is recommended, not as a remedy, but as a protection for plants from attacks by the responsible fungi. Moreover, where some plants may be affected, Bordeaux mixture is recommended to prevent the disease spreading to healthy and unaffected plants.

Where the crop is growing in renches, in proper trench conditions, heavy watering should be done only where drainage is good. There may be greater liberty with watering where plants are growing in single rows, double rows, or beds. Liquid manure may be applied liberally, always after watering.

DON'TS

DON'T allow the onion crop prolonged growth after the tops have begun to turn yellow. This colour is the sign of maturity.

DON'T lose an opportunity of adding organic matter to the soil. It is the main basis of bacterial life.

DON'T hesitate to accept an invitation to visit another garden. Something may be learnt.

DON'T set out spring cabbage plants till the weather is cooler. To do otherwise is to invite aphides to the feast.

Beans

Dwarf bean plants should receive the best possible treatment so that the crop is secured before growth is stopped by cold weather. Beans are very sensitive to cold, and conditions usually prevailing at the end of March do not enable plants to mature in the ordinary way. Weak liquid manure and soil kept well banked up on the plants for support give considerable assistance.

To prolong production on climbing-bean plants, pods should be picked when young. In saving seed for future cropping, only the product of disease-free, healthy, vigorous plants should be selected. The diseases most damaging to bean plants are seed-borne.

Peas

Although peas are not so susceptible to cold as beans, plants which have set pods should be encouraged in the same way as beans to bring the crop to maturity. As with beans, seeds for future use should be saved only from disease-free, healthy plants.

Silver Beet

In favourable districts, silver beet plants may still be set out. The area used should be well drained and in a favourable position, otherwise the plants should be set on a raised bed. Recommendations for manuring and planting appear on page 84 in the January issue of this Journal.

Seeds to Sow

Sowings of spinach, lettuce, and, where favourable, carrots, may still be made. Lettuce plants, when set out later, must be in a position where drainage is good. When spinach and carrot seed are sown, a sheltered part of the garden should be chosen and a raised bed made up. This sowing of carrots will meet the need for early young roots, and should, if properly grown and harvested, supply household requirements well into early summer.

Varieties of vegetables recommended are:—

Lettuce: Neapolitan and Wonderful (both winter special); Spinach: Prickly Winter; Carrots: Earlykrop, Early Shorthorn.

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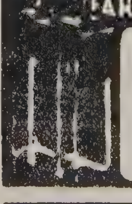

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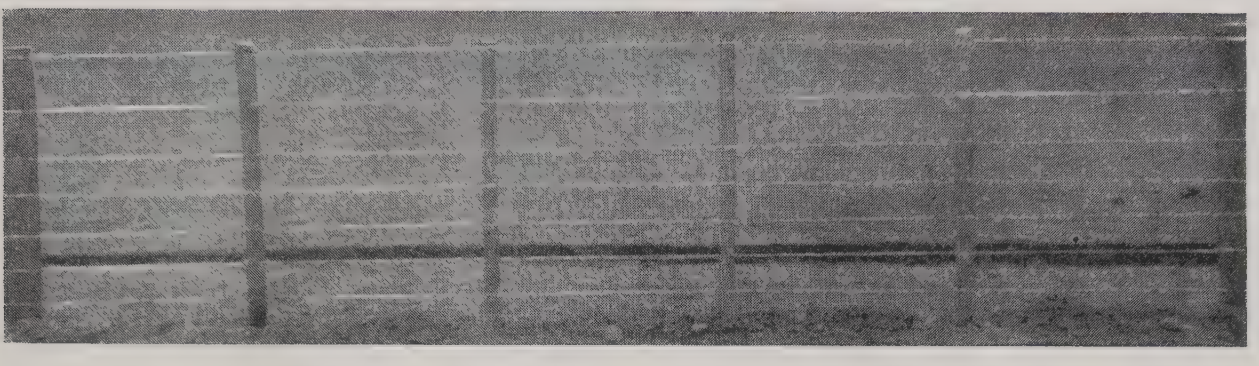
Preservative Treatment of Fencing Posts



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The New Zealand
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THE use of non-durable fencing posts is a poor investment, as labour costs form a large proportion of total fencing charges. If treated with an approved wood preservative, however, the life of many such woods can be increased sufficiently to make their use as economical as naturally durable species.

The preservative is best injected into the wood under pressure, but for farm work, where pressure equipment is seldom available, creosote, introduced into posts by soaking them for some time first in hot and then in cold creosote, is an ideal preservative, and posts properly treated in accordance with the following recommendations will prove durable and economic in service.

General Practice

Preservatives injected into timber poison the wood substance, etc., upon which the decay-producing fungi live. Except in the case of a few porous woods, it is impractical or impossible completely to impregnate most forms of timber, and the general practice is to create an outer protective envelope around the untreated interior wood.

Experience has shown that, in general, increased durability is in approximate ratio to the amount and permanency of the preservative used. It is extremely difficult to penetrate the heart-wood of most timbers with preservatives, and for this reason natural round posts which contain an outer envelope, often of easily treated sapwood, are most satisfactory for treating.

Preparation of Posts

Only sound wood free from decay should be treated. If decay has once started it will not necessarily be destroyed by the preservative, but will probably extend and destroy the interior of the wood beneath the treated portion. A few simple precautions should always be taken to minimise the risk of timber being infected with decay before treatment.

The first precaution is to bark and peel all round timber immediately after felling. This will retard attack of fungi and wood-boring insects, which quickly commence their destructive activities beneath loose pieces of bark where moisture tends to collect and conditions are favourable for rapid decay. Thorough barking is also important to ensure the maximum penetration of the preservative, as even small patches of bark will often effectively prevent penetration. Thus, in peeling posts of many exotic species such as pines, cedars, etc., care should be taken to remove all thin inner bark, particularly from that portion of the post near the groundline. If this operation is not carried out carefully a piece of bark which has been missed is liable to be subsequently knocked off, thus exposing poorly treated wood. Effectiveness of preservative treatment depends on maintaining an unbroken area of treated wood entirely around the post. The posts are most easily barked in the early spring.

A second precaution is to ensure that the timber is thoroughly seasoned. Creosote cannot readily enter wood the cells of which are already filled with water. Fence posts can be satisfactorily seasoned by open crib-piling in a shady yet exposed locality where, in particular, there is ample circulation of air both beneath and through the whole pile. Damp ground should be avoided, and the soil around and beneath the piles kept free of all living and rotting vegetation during the whole process of seasoning. A minimum seasoning period of six months is recommended, but it is difficult to give a general recommendation, as species, location, season of the year, and size of posts are all of importance in determining

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how long it will take posts to reach the seasoned condition. If facilities are available, a good test for seasoning is to weigh a few posts at intervals. When the weights remain fairly constant during two weeks of good seasoning weather the posts can be considered dry enough to treat. One of the major objectives in thoroughly seasoning the wood is to ensure that no further shrinkage and splitting occurs after treatment, thereby breaking the envelope of treated wood and affording entry for decay-producing fungi to the interior untreated wood.

It is also advisable to cut the tops of posts at a slight angle to prevent lodgment of rain water, a precaution especially necessary in the case of rapidly-grown exotic pines, etc.

Fences like this are worse than useless. Sources of supply of durable fencing timber are limited, but the life of non-durable timbers may be increased by the use of an approved wood preservative.

Choice of Preservative

Toxicity, or the poisoning property of the preservative, and its permanence are the factors largely governing the value of any preservative, and are possessed by a group of oils known as coal-tar derivatives, of which creosote is the most valuable and economical. A suitable grade known as the British Engineering Standard Specification Oil can be purchased in bulk from the larger local tar by-products manufacturers. Other coal-tar derivatives, known as carbolineums, are also obtainable, but, in general, such oils are proprietary preparations.

Due to their slightly better penetrating power, the claim is often made that mere brushing or dipping applications are sufficient to increase the life of the wood for long periods, but users are warned that sufficient absorption and penetration are secured only by appropriate soakings. Tar is not recommended on account of its relatively poor penetrating powers and dirtiness, while if applied to green timber, it causes decay to develop more rapidly than in untreated wood.

Construction of Treating-Plant

The simplest equipment consists of two 90-gallon steel drums measuring approximately 3ft. 4in. in height and 2ft. 4in. in diameter. An end is cut out of each drum, one of which may be used for the hot bath and the other for the cold. They may be mounted on bricks and a proper flue provided, or placed over a fire-pit dug in the ground. Means should be provided for preventing the access of rain water into the tanks, but on account of the fire danger the equipment should be removed from the immediate vicinity of buildings.

How to Creosote Posts

The open tank process is the most suitable and effective method of treatment for farm use. The posts are first soaked in a drum of creosote maintained at a temperature of between 180deg. and 200deg. F., which causes the air in the wood cells to expand and some of the air and moisture to be driven out. On transferring the posts to the cold creosote bath the expanded air contracts and creosote enters the timber. Owing to the poorer penetrating powers of creosote at normal atmospheric temperatures and the deposition of solid material on the posts making them dirty to handle, it is essential to keep the temperature of the cold bath above 90 deg. F., preferably as near 100 deg. F. as possible. The hot-and-cold effect may be secured by leaving the posts in the hot creosote and allowing it to cool off overnight, a method which is peculiarly adaptable to the treatment of refractory timbers such as larch, which requires exceedingly long treatment. It is, however, not so economical of creosote with most other timbers, and if the temperature has been allowed to fall below 90 deg. F. during the night the oil should be reheated to 100 deg. F. before withdrawing the posts. The time necessary to leave the posts in the hot and cold baths varies with the species, and the penetration and absorption required.

The posts are placed with their butt ends in the hot bath and given the requisite hot treatment. They are then transferred to the cold bath for the required time. The tops are given the somewhat lighter treatment recommended by inverting them in both the hot and cold baths. The top and butt treatment, of course, may be combined by the use of a single tank in which the whole of the post may be immersed and treated as recommended for the butt section. In heating the creosote the level of the oil should be kept about 6in. below the top of the drum and its temperature always below 200 deg, F., otherwise it may boil over and catch fire, with disastrous results to the plant.

For that portion of posts and other timbers in contact with the ground the whole of the sapwood should be impregnated. If, due to difficulty of penetration or over-absorption of creosote, this is not secured, a penetration of from ½in. to 1in. may be accepted, although considerably less may represent the maximum which can be secured with larch and other refractory woods. For that part of the post out of the ground a somewhat lighter penetration than that recommended for the butts of the posts is satisfactory. Under these conditions a post will absorb on the average from ½ gallon to 1 gallon of creosote. When tests for penetration are made with an auger, etc., care should be taken to fill the whole with creosote and to plug it with a piece of creosoted wood.

The recommended treatments for the various species are set out in the accompanying table.

Durability

Unfortunately, there are few authoritative records available regarding the durability of treated timber in New Zealand. The New Zealand Railways creosoted rimu and white pine sleepers over 30 years ago, and many of them lasted as long as 14 years—some over 30 years—before removal, which was due to mechanical failure rather than decay. In fact, some of the sleepers removed were subsequently used for fencing posts.

Since 1922 the New Zealand State Forest Service has installed a variety of treated exotic pine, larch, eucalypt, etc., and native timber posts and kept them under observation. Some of these posts, treated according to the recommendations made herein, are still perfectly sound, while untreated or lightly treated posts of the same species decayed after only a few years. The tests also demonstrated the necessity of a fairly substantial top treatment for non-durable species, as with the copious rainfall occurring in most parts of New Zealand untreated portions of posts out of the ground rapidly decay from the top downwards.

Generally, if the posts are given treatments according to the foregoing recommendations, a life approaching 20 years can be confidently expected.

Species.	Butt.		Top.	
	Hot Bath.	Cold Bath.	Hot Bath.	Cold Bath.
	Hours.	Hours.	Hours.	Hours.
Pines (*Pinus* spp.)	1	½	½	1
Eucalypts (*Eucalyptus* spp.)	3	2	1½	1
Poplar and willow (*Populus* and *Salix* spp.) ..	3	2	1½	1
White birch (*Betula alba*)	2½	1	1½	½
Wattle (*Acacia* spp.)	5	2½	2	1
Hinau, tawa, kamahi, rewarewa, tawhari, matai	5	2	2	1
Mountain and silver beech (*N. cliffortiodes*. and *N. Menziesii*)	8	4	3	1
Larch (*Larix decidua*)	8	12	4	6

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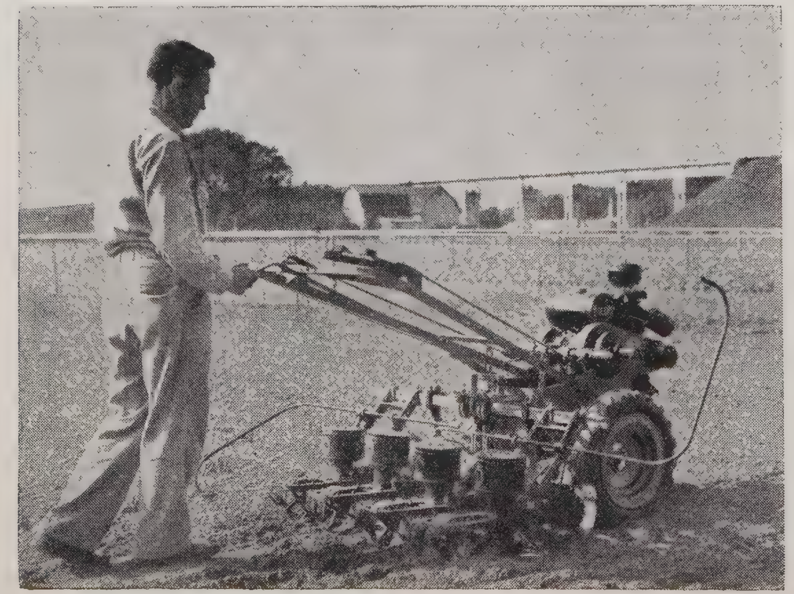

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Answer to Correspondent

Mare's Lameness

M.E.S.-L., Waipawa:—

I have a 16-hand hack mare with a kind of lameness in the off hind leg. There appears to be nothing wrong with the foot. When standing she rests it in the usual way, without holding it back or forward. She will not put any weight on this leg, even when the front foot is held up, but always keeps it bent at the hock.

A friend of mine declares it is "slipped pin," but I cannot see any abnormality of the quarter when viewed from the back. If this were slipped pin, how could I be positive about it? Is there any test or reaction when the leg is taken up or held out? Should I call in a vet.?

The mare is in excellent condition, and has been lame for 10 days and has not been worked, but has been running with three other horses on a part-flat, part-hillside paddock. There is a boggy creek into which the horses go up to their bellies in water to eat the floating sweet grass.

LIVESTOCK DIVISION:—

It is difficult to give a satisfactory diagnosis in a case of this kind without an actual examination. You would be well advised, if the mare is of any value, to consult a veterinary surgeon, since, should the lameness be due to a foot lesion which you may not have spotted, the sooner treatment is commenced the better.

It is not clear what is meant by "slipped pin." If it implies fracture of the "pin bone"—the bone which projects above the stifle at the side of the quarter—there is nearly always a lopsided appearance of that quarter when an animal is viewed from behind.

There is a possibility of spavin inflammation of the hock bones. This lameness will be more evident if the hock is forcibly flexed for a minute by raising the foot as high to the stifle as possible, then making the animal walk as soon as it is released.

Puncture or injury to the sole of the foot, a suppurating corn, or severe sprain or inflammation of the fetlock ligaments might account for failure to bear weight on the foot; considerable pain and, in foot injury, possibly a rise in temperature would be noted.

Intermittent displacement of the patella or knee cap in the stifle joint might be indicated by intermittent lameness, during which the leg is "locked" in a backward extended position. The bone may return to place with a click and the animal appear sound again for the time being.

The above are all possibilities to be considered.

YOUNG FARMERS' CLUBS

Lincoln Old Students' Scholarship

R. W. WIGHTMAN, Methven, 1946 Winner.

THE Y.F.C. Federation is indebted to the interest and generosity of the Old Students' Association of Canterbury Agricultural College in making available to Y.F.C. members an annual scholarship tenable at Lincoln College. For some years this took the form of a half-scholarship available to Y.F.C. members in the South Island only, but last year it was increased to a full scholarship, to the value of £55, and made available annually to active members of Young Farmers' Clubs in both islands. This year it has been won by Robert Wilson Wightman, of Methven.

From this year an old student is giving an annual donation of £5, which the Old Students' Association has decided to award to the Y.F.C. scholarship-holder for the purchase of approved books.

The scholarship is tenable at Lincoln College in any one of the following courses:—(a) The College Diploma course; (b) the Intensive Eight Months' course; (c) the Rural Valuation and Farm Management course.

Applications for the scholarship were called, each club being allowed one nomination through its local District Committee. District Committees were asked to make one selection each from the club applications, and to forward them to headquarters for final selection by a committee set up by the federation. The selection committee consists of Messrs. L. J. Wild (Grand Patron of the Y.F.C. Federation), A. C. Cameron (Dunedin), and S. Freeman (Dominion Organising Secretary).

It was disappointing that only six applications were received last year, but general gratification was expressed that both the value and scope of the scholarship had been extended. A number of clubs wrote regretting that the amount of work on most farms at that time prevented members from seeking to take advantage of the opportunity offered, and signified their intention to keep the matter in mind for the future.

Thirteen applications were received for this year's scholarship from the following District Committees:—Auckland, Waikato, Eastern Bay of Plenty, Manawatu, Southern Hawke's Bay, Northern Hawke's Bay, Wairarapa, Marlborough, North Canterbury, Mid-Canterbury, South Canterbury, Eastern Southland, and Western Southland. Members of the selection committee were impressed with the general standard of the nominations and expressed the hope that more members would apply in future, so that every District Committee would put forward a candidate.

Winner's Fine Record

The successful applicant for this year's scholarship, Robert Wightman, is a member of the Methven Y.F.C., Mid-Canterbury. He is the son of Mr. and Mrs. R. W. Wightman, Rangitira, Barrhill. He was born at Timaru and educated at Methven District High School. He took part in tennis, swimming, and ice skating, and represented his high school at football.

The Methven Young Farmers' Club, of which Robert Wightman has been a member since 1936, was formed in 1935. Robert Wightman became one of the most enthusiastic members, and took part in all club and district activities. He was a keen debater, representing his club on many occasions in inter-club, inter-district, and inter-council contests. He won the Dunkley Cup for impromptu speaking in 1942. He was treasurer of the club for two years, and was chairman in 1942 and 1943. In 1944 he was appointed chairman of the Mid-Canterbury Y.F.C. District Committee, which office he held for two years, and in 1943 he was elected chairman of the Canterbury Y.F.C. Council. He entered the Air Force in January, 1945, and acted for a time as secretary to the Young Farmers' Club established at the R.N.Z.A.F. Station, Nelson.

Robert Wilson Wightman.

Robert Wightman has attended the annual general meetings of the federation for a number of years, and has proved a very useful delegate to his District Committee, to his council, and on the Dominion Executive Committee. Being also a member of the N.Z. Farmers' Union he has been able to assist in establishing a valuable relationship between that body and the Y.F.C. in Mid-Canterbury. He is taking up the Intensive Eight Months' course at Lincoln College, and members throughout the Dominion will congratulate him on gaining the scholarship.

The runner-up for the scholarship was David Gilmore Muir, of Five Rivers Y.F.C., Eastern Southland. A half-scholarship (to the value of £25) has been awarded to him by the Southland Frozen Meat Co., and he also will now be attending Lincoln.

Y.F.C. Holds A. & P. Show

Feilding & District's Enterprise

UNDER the auspices of the Feilding Y.F.C., a very successful A. and P. Show was held on the Feilding Show Grounds on November 27. With the co-operation of surrounding clubs, and backed by the Manawatu District Council, there was an outstanding exhibition in all classes. The inclusion of the Manawatu-Oroua Boys' and Girls' Calf Club championships and the Feilding A. and P. Association's fat lamb competition, sponsored by the N.Z. Meat Producers' Board and Messrs. T. Borthwick and Sons, gave added interest to the show. Valuable assistance was given by the president, secretary, and committeemen of the Feilding A. and P. Association, which, together with the Feilding Racing Club, had placed their grounds and equipment at the disposal of the Y.F.C. show executive.

Apart from the calf clubs and the fat lamb competitions, there were 511 entries for the show from 96 competitors. The calf clubs had 80 entries and the fat lambs 153, a total of 744 entries in the show. A good attendance of the public encouraged the Y.F.C. venture, and in opening the show the patron, Mr. W. H. Henson, congratulated the Feilding Club and the other clubs who had generously co-operated with them. A Government publicity film was taken at the show for exhibition in picture theatres. Much credit for the success of the gathering is due to the following execu-

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tive officers: Chairman, L. E. Hansen; organiser, Erl Beazer; secretary, G. J. Gray; assistant secretary, D. J. Griffin.

Hacks and ponies predominated in the horse classes, and there was a good entry of working horses. In the cattle sections Shorthorns and Friesians were well represented, but Ayrshires and Jerseys provided the largest classes, and there were good entries in the crossbred dairy cattle sections. Southdowns and Romneys comprised the bulk of the entries in the sheep classes. In the pig classes Berkshires were in the majority, with moderate entries of Tamworths, Large Blacks, and Large Whites. The porker and bacon classes were keenly contested. A feature of the show was the Boys' and Girls' Calf Club entry, the efficient care and ringcraft displayed by these young competitors being reflected in the excellent quality of the animals. The district fat lamb open competition and the class for Y.F.C. members aroused widespread interest among older farmers as well as the young men. Judging was performed by outstanding breeders in each class, to whom the Y.F.C. is grateful for efficient services freely given to encourage the younger breeders.

Handyman's Farm Inspected

Te Awamutu Club's Field Day

ONE of the most interesting things about farming is that to be really successful the man on the land has to be a jack-of-all-trades. The high degree of versatility that can be attained was very ably illustrated to members of the Te Awamutu Y.F.C. when they recently attended a field day on Mr. E. J. Krippner's farm, Te Rore. This 100-acre dairy farm could very aptly be termed a "conjurer's box of tricks," the strangest part of which is that every one of its gadgets and labour-saving devices has been thought out and assembled by one man in his spare time.

The property, facing nicely into the sun, has a fair proportion of flat land, the balance being gently rolling. Approximately 50 Shorthorn cows are milked and all the calves are reared. No pigs are kept, as, apart from animal droppings, the balance of the skim-milk not fed to the calves is the only top-dressing the land receives. The steer calves, generally sold about March, are a very profitable sideline, although, if the feed were available, Mr. Krippner would prefer to winter them and sell them in the spring when they would command a better price.

Each paddock is harrowed about once every 4 years with a type of harrow which is something like a spring-tooth cultivator cum rotary hoe. This implement, not unlike disc harrows in its set-up, is drawn by a tractor home-made from a truck, three such vehicles being employed on the property. A hay elevator, complete with its own engine and mobile hay racks which need filling only once every 2 or 3 days, are other labour-saving devices. The racks can be placed on steep faces or other unproductive areas, where the droppings and trampling that takes place around them improve the sward.

A steam steriliser which is kept alight with a small quantity of wood and can produce boiling water in a few seconds merely by directing a nozzle into a bucket of cold water is a feature of the milking shed. The yard and gateways are all bricked instead of concreted, as bricks, being porous, absorb moisture and prevent mud.

Everywhere club members went they met labour- and time-saving devices, many of which would undoubtedly be of use to them on their own farms. Three windmills, each with its own benzine motor in case of calm weather, were placed in view of the homestead with their own indicators, so that the water content of the reservoirs could be ascertained at a glance. These indicators consisted of rods with a floating metal ball on one end in the water and a white metal disc on the other.

A very instructive day concluded with afternoon tea provided by Mrs. Krippner, and members went home with the realisation that a little brain work on the farm can eliminate much of its drudgery.

—F. E. TURNER, Hon. Sec.,
Te Awamutu Y.F.C.

Te Awamutu Club members on Mr. E. J. Krippner's farm, Te Rore.

Apiti Shearing Competition

A SUCCESSFUL shearing competition was held by the Apiti Y.F.C. in Mr. Len Martin's shed on Saturday, November 10. About 50 were present, 24 of them competitors, including members of the Rangiwahia, Waituna West, and Kimbolton Clubs, the visitors filling the places in all the events.

Winners of the classes were:—Learners: N. Thompson, Rangiwahia, 1; J. Small, Waituna West, 2. Intermediate: N. Shannon, Waituna West, 1; J. Shannon, Waituna West, 2. Championship: L. Gerke, Kimbolton. "Fleeco" competition: V. Thompson, Rangiwahia, 1; F. Sowerby, Waituna West, 2.

Messrs. A. McMurtrie, Table Flat, and L. Martin, Apiti, were the shearing judges, and Mr. H. H. Jensen, Table Flat, judged the "fleeco" competition.

The chairman, I. Old, thanked the judges and visitors, Mr. Martin for the use of his shed, and Messrs. J. McIntyre and L. Martin for the loan of the sheep.

Mr. McMurtrie said it was very pleasing to see the number of young men taking on shearing and the good job they were making of it, as there was a growing need for younger shearers.

—R. L. NICHOLSON, Hon. Sec.,
Apiti Y.F.C.

Flaxbourne Club's Social Evening

A VERY enjoyable social evening was recently held by the Flaxbourne Y.F.C. to bring together members and friends of the three Marlborough clubs—Blenheim, Seddon, and Flaxbourne. Invitations were sent to those who had lectured to the club during the year, to several others who had helped with dog trials, etc., and to all Marlborough members and advisory members. The attendance of 45 was considered quite good for a cold, wet night. Among the guests were several young men from Clarence Bridge who are interested in the work of the Y.F.C. movement and who are contemplating forming a club in their own district.

The club chairman, J. Forsyth, proposed the toast of "The King," and the advisory president, Mr. W. S. Morrin, proposed the toast of "Our Grand Patron." A toast to the Y.F.C. Federation was proposed by Mr. A. Wooding, one of the older members, and the club's first chairman in 1938, who spoke on the federation's progress and its value to the Dominion, and referred to the first five years of the club's existence. This toast was replied to by a former advisory president, Mr. A. Loe. Between toasts there was community singing, with N. Gee, a member of the Seddon Club, at the piano.

Appreciation of the help given to the club by lecturers and others was expressed by Mr. E. Loe. J. Parsons, a member recently returned from overseas, proposed the toast "Our Absent Friends." A "home-made" supper was provided by Flaxbourne members. The toast "Our Friends from Blenheim, Seddon, and Clarence Bridge," proposed by the secretary and replied to by Messrs. B. Walsh, H. Glewis, and D. Muddleton, terminated a very successful and entertaining evening.

—E. F. RUDD, Hon. Sec.,
Flaxbourne Y.F.C.

Five Forks Field Day at Hakataramea

EIGHTEEN members of the Five Forks Young Farmers' Club recently visited Messrs. McCaw Bros.' properties at Hakataramea.

During morning tea Mr. F. McCaw handed round photographs of sweet clover at various stages of growth and being ploughed under when it was nearly 7ft. high. Members then inspected the ploughs, a four- and a five-furrow, both pulled by one tractor, which plough as much in an hour (3¾ acres) as a team of horses and a double-furrow plough can do in a good day's work.

The party then saw wheat being sown with two tractors cultivating and another drilling. The big tractor pulling two cultivators covered 23ft. at a time.

A paddock of wheat about 2in. high near the homestead was then examined. Half of this paddock was ploughed and worked the usual way; on the other half the "Plowman's Folly" method was used. It will be interesting to compare yields under the two methods.

In the afternoon, on the way to Mr. J. McCaw's property, a method of attaching two rollers to use together was demonstrated, and a huge one-way set of disc harrows was also inspected.

The party were very interested in the workshop and its contents, particularly a very useful type of endless chain.

An English Penfriend

The following letter has been received, through the National Federation of Young Farmers' Clubs in Great Britain, from a young farmer in England.

"I would very much like to write to a farm worker in New Zealand or Canada, as I am very interested in both these countries, and I want to know more about them, their progress during and after the war, and what sort of crops, cattle, and methods they use, as you can never learn enough about farming. I feel that getting to know someone from overseas helps to broaden one's ideas in many ways.

"I am very keen on farming. . . I am 18 years old.

"Hoping that you will not disappoint me.

(Signed) Peter Longhurst,
Cackets Farm, Cackets Lane,
Cudham, Kent, England."

Y.F.C. members are invited to correspond with Peter Longhurst. There is much to be gained by the exchange of ideas in this way, and such relations should be encouraged, as they go far towards promoting a greater understanding between peoples and countries.

The five headers on the property were all fitted with various improvements, the main one being two sets of wheels underneath to keep the header on an even keel going through a dip. A number of other implements seen carried improvements.

The club chairman (E. F. Ruddenklau) thanked Messrs. McCaw Bros. and Mrs. J. McCaw for the trouble they had taken to make the field day such a success.

—J. F. WILSON, Hon. Sec.,
Five Forks Y.F.C.

* * *

Profits From Trees on Waste Areas

OXFORD CLUB AT HOMEBUSH

How thousands of acres of apparently useless gorse- or scrub-covered areas, steep terraces, old water-courses, and ground that is periodically under water could be made profitable by the planting of exotic trees was demonstrated to members of the Oxford Y.F.C. last year when they visited Mr. J. Deans's property at Homebush, in northern Mid-Canterbury, approximately 1,000ft. above sea-level.

Mr. Deans showed how gorse up to 8ft. high had been completely killed by the use of Douglas fir, which forms a very thick canopy, and is a very quick grower. The trees are planted at intervals of 7ft. and gradually thinned to 18ft. apart. The approximate yield of a hundred thousand feet per acre would return about £350 to £400 per acre, an annual return over 60 years of £6 10s. an acre.

Mr. Deans has a very fine grove of redwoods, up to 130ft. high, growing on ground which is under water periodically. He pointed out how Nature prunes trees grown under forest conditions, the periodical heavy snowfalls breaking off the lower branches that are weakened for want of sunlight, resulting sometimes in perfectly clean trunks of 70 or 80ft. Oaks growing among other tall-growing trees had clean straight trunks over 100ft. high. Mr. Deans also has many species of rhododendron.

One exceptional tree in a *Pinus insignis* plantation up to 80 years old was 150ft. high and estimated to mill 5,000ft. of timber. Other trees inspected were horse chestnuts, cherry trees, larches, spruce, ash, macrocarpa, black poplars, gums, and cedars.

The party was entertained at afternoon tea by Mr. and Mrs. Deans, who were thanked for a most instructive and enjoyable day.

—K. G. FRAMPTON, Reporting Secretary,
Oxford Y.F.C.

* * *

Reports on Club Activities

DUNEDIN

Palmerston.—Field day to be held on Bushey Park Estate and on Mr. Ivan Smith's property at Bushey. Mr. P. B. Gow gave full details of the Young Farmers' Clubs' bays at the Otago Winter Show, Dunedin; several members of the Dunback Club were present, as this matter concerned their club also. Attendance of eight members out of total of 31.

NORTH OTAGO

Enfield.—Arrangements for a field day to be held on several farms in the Hakataramea Valley. Club picnic to be held on Boxing Day. Sixteen members present out of 25.

MID-CANTERBURY

Ashburton.—F. Amos appointed club reporter. The club's pasture competition to be held on Mr. Langdon's farm, near Ashburton; prize of 10/6 for the winner donated by Mr. Cameron. Attendance of 21 members out of 27.

Wakanui.—Motion of sympathy to Mr. M. D. McDowell on the death of his mother. Lecture on "The Tractor and Header Harvester" by Mr. W. Hay, of Andrews and Beaven; Mr. Hay outlined the necessary points to check and observe when starting a new tractor, and gave advice on simple repairs that could be effected to machinery on the farm. Eleven members present out of 16. Previously unreported meetings: Members who attended the field day at Lincoln College congratulated on winning all four sections of the inter-club pasture competition. Annual prepared speech contest: L. Hyland ("Deterioration of Rural Life"), 75 points, 1; S. Watson ("Age of Machinery"), 71 pts., 2; B. Hyland ("Soil Erosion"), 68 pts., 3; Mr. R. G. Ross acted as judge and Mr. A. Amos as chairman and timekeeper. Seven members were selected to take part in the inter-club stock-judging at Longbeach, and a demonstration on Corriedale sheep was given by Mr. R. J. Martin, who also gave hints about the breed to the members taking part in the competition. Attendances of nine and 14 at the respective meetings. The club pasture competition was held on Mr. A. Amos's property. Mr. G. K. McPherson, Department of Agriculture, outlined the rules and points awarded in the contest. The results were: L. Corbett, 75 points, 1; S. Watson, 68 points, 2; K. Butterick, 63 points, 3.

CHRISTCHURCH

Ellesmere.—One new member enrolled. Address by Colonel Stafford on the origin and uses of sulphanilamide, penicillin, and D.D.T. Twenty-six members present out of 60.

NORTH CANTERBURY

Amuri.—The club recently sponsored a very successful concert in the Waiau Hall, the Excelsior Piano Accordion Band and leading Christchurch artists supplying entertainment to a large crowd. After the concert a very enjoyable dance was held, music being supplied by the Excelsior Piano Accordion Band. The club donated half the proceeds to the Amuri R.S.A.

Cheviot.—Field day at Spotswood. Demonstrations and lectures included the following: Southdown cross lambs (Mr. J. Beckett); "Establishment of Pastures," etc. (Mr. E. G. Smith, Department of Agriculture); Certified ryegrass, white clover, etc. (Mr. J. B. Stevenson); Montgomery red clover, etc. (Mr. A. E. Page); Waiau River erosion (Mr. P. A. Barnes); pick-up baler (Mr. W. J. Elliott). Lunch and afternoon tea were provided at Spotswood Hall. The attendance of over 30 included 10 older farmers and friends. The club has a membership of 33.

Hawarden-Waikari.—Application to be made to Cawthron Institute for supplies of the parasite for the diamond-back moth. An address on "Australian Rural Life and Farming" was given by Mr. R. O. McGillivray. Twenty members present out of 35.

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Oxford.—Field day on Mr. J. Deans's property, Homebush. Seventeen members attended out of 30.

NELSON

Murchison.—Visit by the Dominion Organising Secretary, Mr. S. Freeman, accompanied by the District Y.F.C. Secretary, Mr. D. Merry. Mr. Freeman addressed the meeting on Y.F.C. matters generally, and exhibited sound films. Attendance of 20 members out of 46.

Tapawera.—B. Hodgkinson and H. Fenimor (active members), and Mr. F. A. Eden (advisory member) appointed delegates to Nelson District Y.F.C. Committee. Transport for a field day at the freezing works discussed. Mr. Thompson, of the Riwaka Tobacco Research Station, exhibited film strips "Tobacco Growing in Canada and U.S.A." Full attendance of 13 members.

MANAWATU

Colyton.—Report on club field day and Y.F.C. Show at Feilding. Discussion on further field day. Mr. Jamieson, of Messrs. Hodder and Tolley, Feilding, gave an address on "Grass Seeds," and dealt also with their growing and harvesting at the Pure Seed Station, Lincoln. Eighteen members present out of total of 22.

Feilding.—The final meeting for the year took the form of a dinner at the Community Centre, Feilding. The chair was taken by Lou Hansen, in the absence through sickness of Erl Beazer, club chairman. A comprehensive toast list was honoured, the following being the speakers and responders: "The Feilding Y.F.C.," proposed by Mr. W. H. Henson (president, Feilding A. and P. Assn.), and responded to by Ian Colquhoun; "Our Returned Services Members," proposed by his Worship the Mayor (Mr. T. L. Seddon), and replied to by ex-service members D. Ferguson, D. Colquhoun, H. Brewster, and L. Beazer; "The Department of Agriculture and the Lecturers," proposed by Mr. L. J. Wild, and responded to by Messrs. H. deO. Chamberlain and A. V. Lithgow; "The Y.F.C. Federation and District Committees," proposed by Mr. H. C. D. Somerset, and replied to by Messrs. S. Freeman (Dominion Y.F.C. Secretary) and McGregor Donald (chairman, Manawatu District Committee); "The Speakers and Caterers," proposed by Mr. A. C. Buist (advisory president), and responded to by Mr. P. Harford. Mr. Somerset gave an address on the cultural and commercial opportunities afforded by farming. Topical sound films were exhibited by Mr. Freeman. There was an attendance of 47 members and friends.

Kairanga.—Discussion on club's progress generally. Drawing of club raffle left to committee to arrange. Nineteen present out of 40.

Kimbolton-Kiwitea.—Challenge issued to the Kimbolton Cricket Club to a cricket match; committee of three appointed to select a team. Talk by Ian Lyon, a club member, on "Weather Forecasting." Attendance of 16 out of 24. At a previous meeting a talk was given by K. Spelman on his experiences overseas, 18 being present.

Te Arakura.—Arrangements for future lecturers. Address by Mr. Hodson, of Massey College, on "The Feeding of Dairy Cows." A talk was also given by H. Oppatt, a club member, on "Treating Cows for Bloat." Attendance of 13 out of 17.

Whakarongo.—One new member enrolled. The chairman congratulated members who won prizes at the Feilding Y.F.C. Show, and also in the fat lamb competition at Longburn. A five-minute talk was given by I. Vant, a club member, on "Farm Bookkeeping." D. Robertson gave a talk on "Experiences in a Fighter Squadron on Bougainville." Twenty-four members present out of 28.

WAIRARAPA

Carterton.—An exhibition of calves and yearlings to be held; prizes, 30/-, 20/-, 10/-, for each class. Mr. O. A. Cadwallader to be asked to judge. There will also be demonstrations and a judging competition. Lecture by Dr. C. V. Gomez on "Handling and Breaking in a Young Horse"; the speaker also answered a number of veterinary questions. Fifteen members present out of 35.

SOUTHERN HAWKE'S BAY

Ballance.—Lantern lecture by Mr. F. J. S. Holden, Department of Agriculture, on "Liquid Manure on the Farm." Fifteen present out of 26.

CENTRAL HAWKE'S BAY

Hastings.—This club has recently resumed activities. Officers elected: Chairman, R. Baddeley; secretary, C. D. Goldstone; treasurer, D. Murley. The appointment of an advisory president was left over for the next meeting. There was an attendance of nine at the initial meeting, and it is understood that there are a number of prospective members.

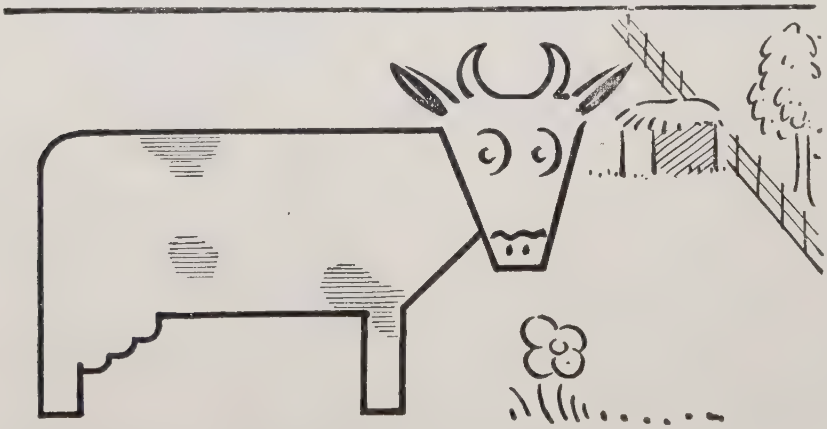
Otane.—Newly-formed club. Officers elected: Advisory president, Mr. J. Cooper; chairman, J. L. Sunderland; secretary and treasurer, E. T. Williams. At two meetings held since the inauguration Mr. R. P. Hill, Department of Agriculture, gave an address on "The Ramifications of the Certification System for Grasses and Clovers," and talks were given by members as follows: J. L. Sunderland ("Shearing"); E. White ("Ploughing"); J. Williams ("Erosion"). The membership has increased to 13.

NORTHERN HAWKE'S BAY

Wairoa.—Address by Mr. J. Hole on "The Care and Maintenance of Electrical Equipment"; the speaker dealt with household and general heavy equipment, and answered a number of questions. At the previous meeting 14 new members were enrolled, 13 of these being trainees of the Huramua Native Scheme. The membership of the club is now 84. Discussion on roll of honour plaque, the design submitted by Mr. G. Winter being approved. Nine members volunteered as associate judges for the Nuhaka A. and P. Show. Mr. A. Allan gave a talk and demonstration on "Farm and Station Stitching," dealing with the preparation and use of threads for leather sewing; members were given the opportunity to try out the various methods. Attendance of 25 members.

WANGANUI

Marton.—Substitute delegate appointed to attend forthcoming District Committee meeting. Advice received from Dannevirke A. and P. Association on Y.F.C. classes at show in February. Approval of the holding of a gymkhana on Mr. K. McK. Duncan's property,



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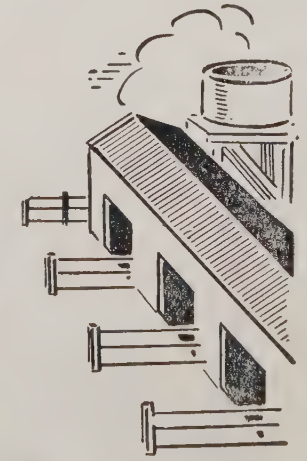

Upper Tutaenui, to raise funds for the Y.F.C. memorial. Dance to be held in the evening. Further selection of judges' assistants and class stewards for the Marton A. and P. Show. Report on club library books ordered from England. Two new members enrolled. Mr. S. G. Avery, of Sanson, gave a talk and demonstration on "Soldering." Talk by Flt./Sgt. W. B. Gray, a returned member, on some of his experiences overseas. Attendance of 24 members out of 40.

Hunterville.—Copies of Y.F.C. literature distributed among members. Discussion on ways and means of raising money for the Y.F.C. memorial fund; decided to hold a series of dances. Address by Mr. V. W. Fullerton-Smith on "The Care and Maintenance of Farm Machinery." Twenty-four members present out of 31.

CENTRAL TARANAKI

Bird Road.—Final arrangements for a dance to be held in Stratford Town Hall. General discussion on future activities of the club; decided to draw up a syllabus at next meeting. Fifteen present out of 18.

NORTH TARANAKI

Karawaka.—Address by Mr. V. C. Davies, of New Plymouth, on "Shelter and Fruit Trees for the Farm and Home." At the previous meeting a report was submitted by delegates on the recent District Committee meeting. One new member elected. Address by Mr. F. L. Knowles, consulting officer to the Taranaki Herd Improvement Association, on "Dairy Herd Improvement by the Selection of a Herd Sire." Out of 15 members, 9 and 11 were present at the two meetings respectively.

Mangorei.—Report on recent District Committee meeting. Address by Mr. Taylor, Department of Agriculture, on "Fruit Trees for the Farm Home." Nine members present out of 11.

Tikorangi.—Lecture, by Mr. A. C. Burgess, Department of Agriculture, on "Taranaki Soils and Fertilisers." Attendance of eight members out of 12.

Urenui.—Programme of future activities discussed; to be further discussed at next meeting. Circular on Y.F.C. land settlement read and discussed. The district secretary, Mr. A. C. Burgess, read an article dealing with land settlement. A general discussion followed on various types of tenure and the classes of country suitable for development. Twenty members attended. This club, which was recently revived, now has a membership of 20.

TE KUITI

Te Anga Central.—Arrangements finalised for a dance to raise funds for the club. Discussion on general activities. Eleven members present out of 23.

WAIKATO

Hamilton Technical College.—Presentation of a wristlet watch to Mr. A. W. Green, the club's advisory president and teacher of animal husbandry at the college, who is retiring. Lantern lecture by Mr. T. Rodda, Department of Agriculture, on "Silage Making." Attendance of 55 members out of 62. Field day on Mr. N. Peacock's farm; Mr. Peacock demonstrated his irrigation scheme, and showed members around his dairy herd, sheds, and pastures. Fifty-six members were present.

Hinuera.—Statement of finance. Address by Mr. Wallace, supervisor of the Waikato Pig Council, on "The Selection, Care, and Feeding of Pigs"; a suitable layout for a piggery was also discussed. Nineteen members present. This club, formed a few months ago, has increased its membership to 24.

Springdale.—Address by Mr. J. Singers on "The Classification of Dairy Cows"; this was preparatory to the forthcoming visit by members to Mr. Singers's farm to see the official classification carried out. Fifteen members present. Officers elected at the initial meeting of this recently-formed club (previously unreported): Advisory president, Mr. J. Singers; chairman, R. Ladd; secretary, G. G. Roberts; treasurer, S. Old. The membership has increased to 17.

THAMES

Ngatea.—Newly-formed club. Officers elected: Advisory president, Mr. C. W. Schultz; chairman, G. Williamson; secretary, R. Cole; treasurer, W. Grimes. Initial membership of 16 is expected to grow rapidly, as keen interest is being displayed by leading farmers in the district.

WESTERN BAY OF PLENTY

Omokoroa.—Two debating teams to be selected. The club decided to assist with the sideshows at the A. and P. Show. A shooting contest to be arranged. Lantern lecture by Mr. A. V. Allo, Department of Agriculture, on "Silage and Hay." Eighteen members present out of 24. At a previous meeting one new member was enrolled, and Pte. R. J. Steward, a returned member, gave a talk on his experiences on active service.

Paengaroa.—Chairman reported on recent meeting of Auckland Council held at Hamilton. Report by B. Vant on District Committee meeting. Suggestions received from members regarding the time and itinerary of the proposed District Y.F.C. tour. Committee appointed to deal with club shooting contest. Report from tree-planting committee; permission has been granted the club to plant trees in the hall section as a memorial. Discussion on proposed agricultural high school in the South Auckland district. Address on "Pigs" by Mr. Barwell, supervisor of the Bay of Plenty Pig Council, who also exhibited a scale model of the Preston piggery. Attendance of 24 members out of 69.

Te Puna.—Demonstration on rope splicing by Mr. N. Heard, a local farmer; members present carried out the actual splicing, etc., under Mr. Heard's instructions. Eleven present out of 24.

EASTERN BAY OF PLENTY

Thornton.—Lantern lecture by Mr. E. R. Marryatt, Department of Agriculture, on "Feed Flavours in Milk and Cream and Their Control." Attendance of 29 out of total of 39.

AUCKLAND

East Tamaki.—Lecture by Mr. A. D. Mercer, Department of Agriculture, on "Supplementary Feeding"; the speaker stressed the benefits in feeding a balanced diet, particularly during the winter months. Fifteen members present out of 41.

Franklin.—Report by the secretary on the meeting of the committee set up to finalise the farm-planning competition, which is to take the following form: Each member to be given a plan of a 100-acre dairy farm, with natural features marked; the farm is in grass and ring-fenced, but otherwise bare. List of materials and prices attached. Members are to develop the farm for cream supply, and compute the cost. Decided that Mr. P. S. Syme, Department of Agriculture, be asked to judge the competition. Arrangements for a club concert to be held at Papakura. A dance to be held at Rama Rama. Messrs. R. Thoms and L. Paul were added to the social committee. Decided to hold a special debating practice; six teams were selected and subjects chosen. Twenty-five members present out of 40. The debating practice was held the following week, 27 members attending; members of the Pukekohe East and newly-formed Karaka Clubs were present by invitation. The debates were as follows: (1) "That the Town Youth has Greater Opportunities for Advancement than the Country Youth"; affirmative, L. Aldridge, R. Clarke, and M. Lorrenz; negative, C. C. Upton, A. Holmes, and E. Black. Won by affirmative. (2) "That Cream Supply is More Profitable than Town Milk Supply"; affirmative, H. Kirton, S. L. Shaw, and S. Adeane; negative, R. Legg, L. G. Shaw, and J. Bryden. Won by affirmative. (3) "That Air Travel will Supersede Land Travel"; affirmative, A. Dunn, R. Thoms, and D. Iles; negative, I. Downs, W. Kirkwood, and J. Bratley. Won by affirmative. Mr. Aldridge acted as judge, and gave some very helpful criticism at the conclusion of each debate. The chairman of the Pukekohe East Club congratulated the Franklin Club on being able to present 18 speakers in one night. The chairman of the Karaka Club thanked the Franklin Club, and particularly its chairman, R. Legg, for the assistance given in the formation of the Karaka Club. Mr. R. W. Franke, advisory president, acted as timekeeper and chairman for the evening.

Karaka.—Report by chairman on a meeting of the combined Auckland District clubs, held at Rama Rama, at which the Dominion Organising Secretary was present. Report by secretary on the recent meeting of the District Committee. Arrangements for a dance. Address by Mr. J. Kidd on "Experiences Overseas, and Farming in the Middle East." Sixteen members present out of 19.

Pukekawa.—Reports on the following: District Committee and Auckland Council meetings, and visit of Dominion Organising Secretary to the district. One new member enrolled. Report on successful hard-up and fancy dress dance. The forthcoming district pig competition was outlined to members. Several remits for the District Committee discussed, mainly dealing with inter-club activities. Endeavour to be made to encourage younger members to speak at meetings, in order to gain confidence for future debates. Members discussed their entries in the farm-planning competition. Attendance of 17 out of 26.

Pukekohe East.—Exhibition of films dealing with "Modern Pig-keeping"; loaned to the club by the N.Z. Co-op. Pig Marketing Association. Attendance of 24 members out of total of 47.

NORTH AUCKLAND

Whirinaki.—Exhibition of films by Mr. E. H. Arnold, Department of Agriculture, Whangarei. Arrangements for club members to visit the demonstration farm at Dargaville in the near future, under Mr. Arnold's guidance. Fishing trip in Hokianga Harbour to be arranged. Twelve members present out of total of 18.

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HOW TO BECOME A SHEARER.

Although it is only by practical experience that one can ever become a shearer, the main essentials to be mastered are clearly given in Bulletin No. 246, "Shearing." In addition to a detailed description, the bulletin contains 27 large illustrations showing the correct cuts and method of holding the sheep from start to finish. The bulletin is available from the Department of Agriculture offices at Auckland, Wellington, Christchurch, and Dunedin. Price 6d.

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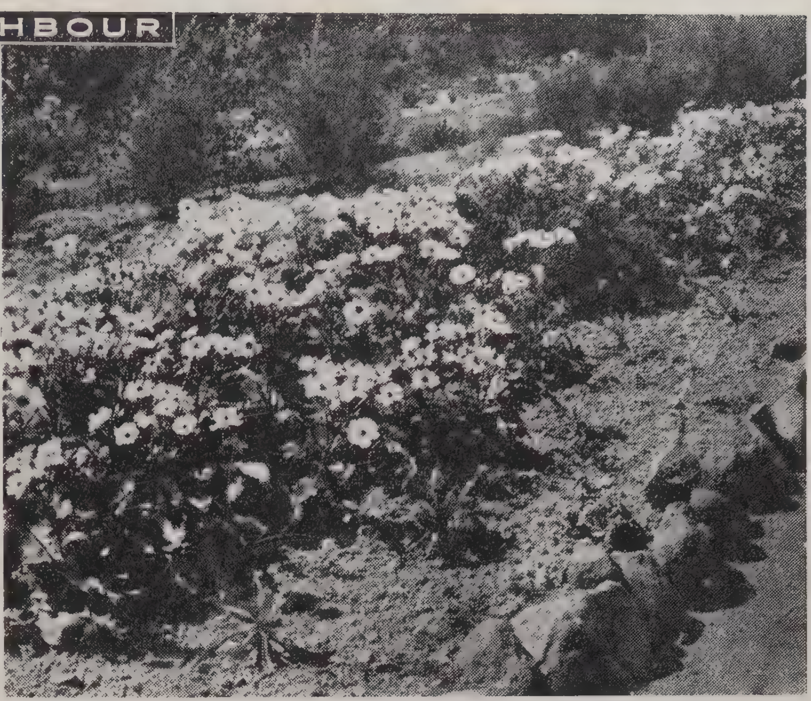
THE GOOD NEIGHBOUR

My Garden



GARDENING is one of the favourite occupations of the majority of "Good Neighbours," and since I tried my hand at remodelling the wilderness I have received so many enquiries as to how my efforts have fared that my letter to you this month is headed "My Garden." Though I have accomplished only part of what I set out to do in the horticultural line, surely "half a garden is better than none," and even if my herbaceous border is far from complete and my rockery lacks many of the plants which give colour and character to this type of garden, I take consolation from the fact that the local wielders of spade and hoe are unanimous in their verdict that weather conditions have been definitely unfavourable towards their activities. Whenever opportunity offers I wage war on shepherd's purse and sorrel, robin-run-the-hedge and rauriki; I strain my back—and my temper—trying to dig out dock roots and remarkably tenacious specimens of couch grass, but as fast as I restore one plot of ground to law and order, the enemy infiltrates elsewhere and so the unequal battle continues. Indeed, my time is so taken up with this extermination campaign that there is very little leisure left for anything else—I read articles on the latest way to increase lachenalia and how to propagate daphnes by layering, and what to do about mildew on pansies, and the best methods of growing bigger and better dahlias, but I never seem to have a chance to put any of these ideas into practice. (I long ago gave up hope of belonging to that select band of enthusiasts who are noted for their collections of bulbs or begonias or bearded irises. I am always so pleased to see my plants bud and blossom that I seldom worry whether or not the blooms are the most perfect of their kind). As for the state of my lawns—well, what if the grass IS dotted with a few dandelions? The leaves are chockful of vitamins and delicious in salads, and the daisies are not only picturesque, but much prized by young visitors for personal adornment in the form of daisy chains.

I am no longer disheartened by my comparatively snail-like progress, for I visited a friend who specialises in peonies and sweet peas and whose kitchen garden would do credit to a professional, and she surveyed her flower beds on either side of the drive and said sadly: "I've never known such a year for weeds! It is only three weeks since I cleared these borders and look at them now."

Sure enough, there was my arch-foe, chickweed, smothering the roots of the shrubs in a thick green blanket; plantains pushed their prim leaves up among the petunias, and carnations struggled to elude clutching tentacles of clover. Apparently even the most experienced gardeners find the problem of weeds a decidedly troublesome one.

However, lest you think that my gardening has been all toil and no pleasure, I hasten to add that everything I have planted has thrived exceedingly. The forsythia and flowering currant cuttings have taken root and blossomed, and even the new little lilac bush put forth a tentative spray of purple. The japonica not only survived transplanting, but has benefited by the change, and the lasiandra I set in a sheltered corner has proved hardy enough so far to withstand the frosts. I now possess a crimson manuka and a white, and am planning to get a double pink one as well and carry out the same colour scheme with camellias. My hydrangea hedge is one of my most successful ventures, and the lacy white flowerets scattered so lavishly over the viburnums augur well for a plentiful supply of ruby-red berries this winter. Of course, I have had a few disappointments — most of the stocks I bought turned out to be the common white variety, and the special poppy seeds I sowed with such care did not even germinate, and a small boy sampled the first fruits of my crab apple in the belief that they were plums, and a horse got in and chewed the tops off my ferns and my lily-of-the-valley tree. I was not very pleased at having to share my rose-bed with apple trees and rhubarb and carrots, but there was no alternative, so "Shot Silk" and "McGredy's Yellow" and that daintiest of pink buttonhole roses, "Cecile Brunner," joined company with the fruit and vegetables. I believe George Eliot had the sort of garden wherein "you gathered a moss rose one moment and a bunch of currants the next—you were in delicious fluctuation between the scent of jasmine and of gooseberries."

Here is a poem which mentions some of the joys of gardening which so richly compensate for all the labour and trouble:—

"There's a lovely healing in a garden,
A sort of magic that one can't explain,
A tenderness that falls on hearts that harden
And brings the flower of hope to bloom again.

There's a special sweetness in its shadows,
My garden's very small—perhaps that's why
I like to stand and look beyond its limits
To one clear patch of bright star-studded sky.

And there are birds at dusk, whose sleepy shuffle
Can stir the stillness of the silent trees,
And I gather scent and sound and sweetness
From moments in my garden such as these."

How precious are those moments when you find the first violet; observe the golden tongues of flame burning in the scarlet censer of a day lily; smell the haunting sweetness of magnolias in the rain; mark the feathery patterns of tamarisk boughs; watch an arctotis emerging from its greeny-bronze calyx; note the exquisite veining of Virginia creeper leaves. These are but a few of the manifold delights which Nature offers those who engage in the "purest of human pleasures" —gardening.

Mary

Mary's at - Home -

MY little son Harold hardly crawls at all now. He walks unaided and loves to go out into the garden and pull the flowers and vegetables, so I am very busy these days keeping him out of mischief.

An old lady who lived to be 89 once gave me the following recipe for a long life:—"Worry less, work more; hurry less, read more; eat less, chew more; grumble less, praise more." I think these health rules are both wise and practical. So many of our ills are due to the wrong mental attitudes. **—"I.H.R.," Whata Whata.**

I HAVE an exercise book in which I jot down the children's funny sayings and I do enjoy reading it over. Some time ago I introduced the children to a "sands-of-time" egg timer and many were their questions as to its use. At last little Miss Know-all said loftily: "I know, it's for Daddy to shave by!"

One of the wee boys has a great habit of putting the cart before the horse in his speech. The other day I heard him singing lustily, "It won't be a stylish carriage; I can't afford a marriage!"—**"Martha," Templeton.**

WE had hoped to have our two sons home from overseas by Christmas, but one is still in Italy so we must wait till later for the great reunion.—**"Effie," Murchison.**

MY 7½-months-old baby now has six teeth that look so lovely when he smiles or laughs. He is such a happy little lad and very good. His latest accomplishment is "clapping hands for Daddy," which he does with great gusto whenever I say the rhyme. Although he cannot crawl he rolls and wriggles all over the floor, and several times I have found him sampling the varnish on the furniture.—**"Pet," Ngaroma.**

WHAT a whirl December was—preparing for Christmas, getting the garden in order, and bottling the gooseberries. Haymaking also hovered near.—**"M," Feilding.**

WE have a wonderful view of the city and harbour, and at night, when all the lights are shining, it is truly beautiful. Visitors stand entranced, and even though we see it every day the picture never palls.

HARBOUR

THE sky was a curdled sheet of gold, the pool a deep goblet, filled with fiery wine. At dawn it was a shield of quivering steel, and in noon's splendour it mirrored in its lucent green the pitched sides, the tangled spars of the ships that rode at anchor in the shadow of the little port. After nightfall it was like rippled black velvet, holding the silver apple of the moon in its depths.—**Marguerite Steen in "They That Go Down."**

The only drawback to the locality is the prevalence of winds which blow, blow, blow. Believe me, Mary, the capital city has nothing on Dunedin in the matter of wind. A recent nor-wester left all our plums lying on the ground. We have only one tree, but it was laden.—**"C.V.W.," Dunedin.**

WE think the standard of the Children's Number of the School Journal is very high indeed and hope the experiment will be repeated next year. We were gratified to find our own school represented by a poem. The children were delighted—they couldn't "believe themselves" in print and all the parents came along to see, too. The children prefer **their** Journal to all previous issues. We hope there will be one issue by children every year.

Everyone had a busy time preparing for the Christmas party. We made all our own gifts: wooden toys and gadgets for the home, soft toys, knitted and felt novelties. It was great fun, but we were surprised to find just how much work was involved in the toy-making.—**"Far North."**

MAY I use the pen-name "Native Flower" when I write? My real name is Rata, so I think the pen-name is appropriate. I enjoyed the article on "Colour," and there are many very beautiful thoughts expressed by other contributors. I am going to make a delightful scrap book from your "Good Neighbour" pages.—**"Native Flower," Waipukurau.**

HAVE you read any of H. R. Gee's books? I have just finished "The Friendly Year" wherein one meets all kinds of folks with the author as he journeys round like David Grayson, the American writer. May I share an extract with you—"Plough shallow, and you'll get a worthless crop. Plough deep, and you'll get a good harvest, most years. What you put in you get out. The patient soil never really lets you down. God's the same—only neither God nor His soil will stand being hurried. Not that it hurts them, of course, but hurrying makes a fool of you."—**"Peggy," Pleasant Point.**

BOOKS

There is no frigate like a book
To take us lands away,
Nor any coursers like a page
Of prancing poetry.
This traverse may the poorest take
Without oppress of toll;
How frugal is the chariot
That bears a human soul!

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WE all went to the very first Waiheke local A. and P. Show. There was an exhibition of flowers and vegetables, also chopping and sawing competitions, horse races, and a sheep-dog demonstration—no "trials," because there was only one entrant for this item. My staid old horse, "Punch," ridden by my husband, quite distinguished himself in the races and I was very proud of him. "Punch" thoroughly enjoyed his day out. It was a beautiful day and they held the show in an ideal spot—a wide, green flat by the Onetangi Road. It had a convenient pine hedge under which to tether the horses. Our small son had never seen Onetangi or the ocean side of the island, so my husband rode the horse home and son and I took the bus to Onetangi, then back to Ostend, where we picked up the boat for Omiha.

Child, shall I tell thee where Nature is most blest and fair? It is where those we love abide. Though that space be small, ample it is above kingdoms; though it be a desert, through it runs the river of paradise, and there are enchanted bowers.—**From the Persian, Fourteenth Century.**

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Our Red Cross sewing circle "broke up" for the holiday period. This gave me a chance to get upsides with some of my mending. We all take work home to do in between whiles, and all the husbands complain that their clothes are not mended properly, poor dears!

I always enjoy seeing the extracts from other "Good Neighbours'" letters. We all have so much in common — sorrows and joys and problems—that it makes one feel very much "all one family."—**"E.W.," Waiheke.**

I'M hoping to experiment with preserving berry fruits by a simple and unusual method—placing dry, just-ripened fruit in dry bottles, corking them, and burying them cork downwards 2ft. under the ground. Have any "Good Neighbours" ever tried this? I do hope it will be successful, for fresh fruit would be a delight in the middle of winter. I'd love to surprise the family with it, as well as making use of the surplus berries.—**"Clara Jane," Rakaia.**

ONE of my father's brothers who had rather an unusual name (we'll call him "X") was killed as a young man. The son dad named after him was killed in France during the Great War. My sister called her son the same name and "X" the third was lost over Germany in this war when his plane caught fire. One wonders if there is anything in a name when three men of different generations and all bearing the same name each met a violent death.—**"Matau," Milton.**

I LOVED the "Good Neighbour" competition. It's wonderful to have a neighbour you can trust. I often feel that neighbourliness is spoiled by poking into the other person's business. My neighbour and I ask no questions of each other, but are spontaneously interested in what we tell each other. It gives me a lovely feeling of security to have such a neighbour.

Some folk's tongues are like the clocks as run on strikin', not to let you know the time o' the day, but because there's summat wrong in their own insides.

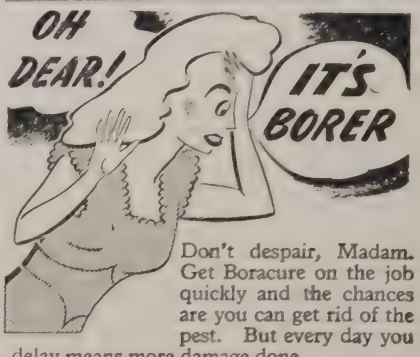
—George Eliot.

The children are well and growing like mushrooms. Two-year-old Helen is so funny now she is starting to talk. She objected to wearing her apron recently on the grounds that it was too hot!—**"Teragram," Timaru.**

READING your pages often makes me realise what good neighbours I have. My husband and I had occasion to go to Tauranga and the train was running two and a half hours late on the return journey. Instead of getting home at 5.30, it was nearly 8 o'clock. We thought of the cows waiting to be milked, but it was no use worrying. When we finally arrived at the shed we found a young neighbour had nearly all the milking done. Wasn't that indeed a neighbourly act?—**"Rayna," Te Puke.**

Tulip Time

AFTER seeing pictures of tulips in Dutch fields as a child I wished that some day I could grow tulips in large numbers also. When I left school a friend sent me a Dutch bulb catalogue and I made up an order for 100 bulbs in 25 different colours. They arrived in early spring and I surprised my friends with spring flowers the following January. I sent to Holland for bulbs twice again and then bought more varieties locally until now I have 37 self colours. These have been a great source of interest to me and at the present time I have several hundreds of bulbs and I sell both bulbs and blooms in season. It is now about 16 years since I first started growing tulips and I still have some of the original varieties.—**"Fintry."**



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Soft Skins and Bright Eyes

Contributed by the Department of Health.

WHEN we eat food, the stomach and intestines turn it into fuel. The blood carries this fuel to the muscles, which use it up, but produce heat in doing so. This heat, which soon accumulates, has to be got rid of through our cooling system, our skin. An automatically-controlled cooling system keeps our bodies at a steady temperature in health. If you get cold the skin contracts and you see the gooseflesh—the blood retreats inwards and keeps warm; if you're hot, you flush—the blood comes to the surface to get cooled—and you also sweat. Evaporating that sweat uses up some of our excess heat. The sweat has also carried away some of our waste products.

The skin has this very important function to perform—to regulate our body heat. It can't work properly if the sweat and grease glands get blocked, so it needs daily cleansing. In summer time the daily swim does this—failing which, the daily bath. The contraction and relaxation of surface blood vessels, skin glands, and pores are helped by skin exercise. This sounds difficult, but is very simple. In this summer weather the best skin exercise is exposure of the whole body to the air for a short time each day—if you've the privacy. Follow this with a brisk rub down with a towel. This simple procedure keeps the skin supple, able to adjust to sudden changes of temperature, and hardens one up against colds. You don't need a sunny day, though gradual tanning is an extra health measure for the skin, as well as for the whole body.

[Sparrow Industrial Pictures photo.

Some vegetables are best eaten raw.

Wear Light Clothes

In the hot weather reduce the call on the skin's sweating mechanism by wearing light clothes. Guard against sudden changes of temperature or evening chills by having an extra wrap available. Cellular type of underclothing is excellent. Light-coloured top clothes are best in hot weather—they don't take up so much of the sun's heat as darker clothes.

Diet comes into it, too, for skin suppleness and bloom are helped by a lighter diet in summer: and that means more fruits and salads. Well, fruits in any quantity may be beyond your purse, so salads must become your mainstay.

COMFORTERS

The little things will heal her—
Flowering grasses and the scent of fir,
Rosemary and spikes of lavender,
Brown birds singing in the ngaio trees,
Bright poppies cradling bumblebees. . . .

And the small rain will lay fingers on her face,
Bringing her comfort in this country place.

—"Tinkle Tinkle."

You'll need a salad every day—with such fruit as you can afford—if you want to be vigorous and full of vim in hot weather and to maintain your resistance to infection. Salads are the best natural beauty foods—they'll soften your skin and brighten your eyes. You will use anything available—some crisp, fresh, raw vegetable is the usual basis, either lettuce or finely-shredded heart of cabbage. There's hardly a root or green vegetable that is not acceptable in a salad. The more raw vegetables used, the better.

Don't be frightened you're not getting food value. A very good lunch in the hot weather is a good mixed salad with wholemeal bread and a little grated cheese topped off with a glass of cold milk.

To Make Salads

When making salads, touch the plants as little as possible. And don't keep salad vegetables lying around the house, or they'll lose vitamin value steadily and quickly. Pick them from your garden just before use, or buy them as late as possible before they're needed. If you must keep them about, put them in a saucepan with a tightly-fitting lid on a cool floor, or in the refrigerator if you have one.

Don't soak salad vegetables, or you'll lose food value, but wash them carefully and chop or grate just before use if you want them to give clear soft skins and bright eyes.

"The Maori House"

HAVING worked for Mr. Alexander Turnbull as a girl, I was greatly interested in the article about the Turnbull Library. A rather amusing incident comes to my mind in this connection. A large number of Mr. Turnbull's books were stored in a room on the top floor of the building. We always called it the "Maori House," as it had beams and rafters instead of the usual ceiling, and often during a wet lunch hour we braved the dust and cobwebs to look over these books and also the big bound files of early newspapers. One of those newspapers now has a little gap in it, for, greatly to my discomfiture, one of the boys in the office had the bright idea of clipping out my birth notice and exhibiting it for the amusement of the rest of the staff!—**"Glendine," Northland.**

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Making New Garments From Old Clothing

IN these days of clothing coupons, rationed goods, scarcity and expense of new materials, we should all try to make use of any clothing or material on hand, advises Eva Topping, Rural Sociologist, Department of Agriculture, Auckland. If not needed by our own families, discarded garments can be donated to relief organisations for the distressed people overseas. No clothing should lie uselessly in cupboards to provide a feast for moths, but every garment which has any wear in it should be made to serve some purpose. If it is quite unwearable, convert it into a smaller garment, and use the scraps for making rugs, bed covers, mops, or floor washers. Turn out your wardrobes, cupboards, boxes, and drawers and find every bit of clothing that is not in wear. Probably you will be surprised to see what a large pile of cast-offs you have accumulated and pleased to find more room in your cupboards for the clothes in use. Go over the discards carefully and decide whether they can be worn again if they are brushed, pressed, and darned or patched. Those which are of no use at all in their present state can be remade into fresh outfits for smaller members of the family.

[*Sparrow Industrial Pictures photo.*

Boy wearing completed outfit.

PREPARING OLD CLOTHING

HAVING sorted out the clothing which requires conversion, try to think out what it will most readily make and, if providing for the family, which member is short of that particular garment. For instance, if the small girl needs a new coat for the winter, look through the old clothing with a view to discovering the possibilities. Women's and men's suits, coats, and the heavier woollen dresses lend themselves to remaking into coats for the younger children. Little boys' shorts can be cut from the best parts of any woollen clothing; sports jackets, men's trousers, women's coats, jackets and skirts, any of these would be likely to provide enough good material for new trousers for a young son. Girls' dresses can often be made from two discarded garments if there is barely sufficient material available in one.

Select a garment, and if you feel sure that it is quite unwearable in its present state and its only possible use is when remade into something else, you can begin on the conversion job with a clear conscience. First of all find out how much of the garment can be used. Search carefully for worn or thin places, paying particular attention to elbows, knees, seats, and hem lines. Hold the cloth up to a good light to help you to detect moth holes and similar damage. Keeping these blemishes in mind, try the pattern for the new garment on the cloth.

Unpicking

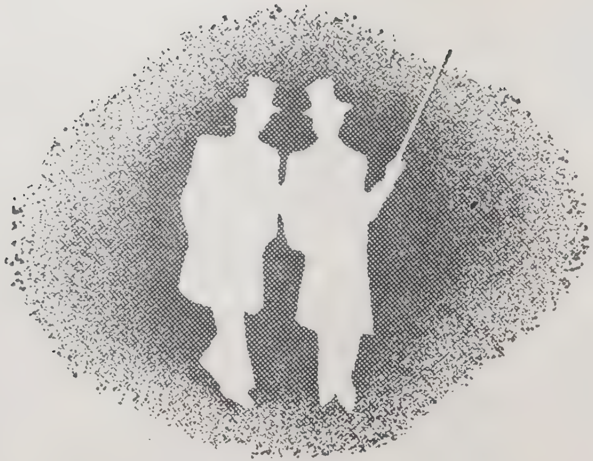
If there seems to be sufficient material, start by unpicking carefully and completely; never try to cut out the fresh pieces while the old garment is intact, as something is sure to go wrong and all your work and some of the necessary material will be wasted. Using an old razor-blade will be a quick way to unpick the seams, but use it carefully or you will cut the cloth or your fingers. A safer way to unpick is to pull the thread and break it off first on one side and then on the other. Remove any buttons, dress-fasteners, hooks and eyes; put aside and save, together with any linings, paddings, stiffenings or tape that may be good enough to use again. Brush the pieces well, remove loose threads, and gently scrape off any lint or dust which has accumulated in the folds of hems, seams, and pleats. Repair any small holes by darning neatly so that they are strong but not conspicuous. If any feature of the old garment was particularly liked or the fit was good, now is the time to cut a paper pattern of it for future use.

Washing

Wash the material if possible, kneading it gently in warm soapy water; do not twist or wring. Rinse well until the water remains clear and hang to dry, making sure the pieces of cloth are not pulling against the grain but are drying straight and true. Choose the brightest side for the right side of the new garment and press while slightly damp on the surface you mean to use for the wrong side. Use a cloth between the material and the iron to prevent shine or scorch marks and take care not to pull crosswise or to ravel the cut edges or pull them out of shape. If the material is good but has faded in patches, it could be dyed a darker shade either at home or at the dyers and cleaners. Remember that dyeing usually shrinks woollens slightly, so be sure to make allowances when estimating the amount of available material.

Choosing Pattern and Cutting Out

In choosing the pattern for the new garment try to keep a mental picture of the various shapes and sizes of



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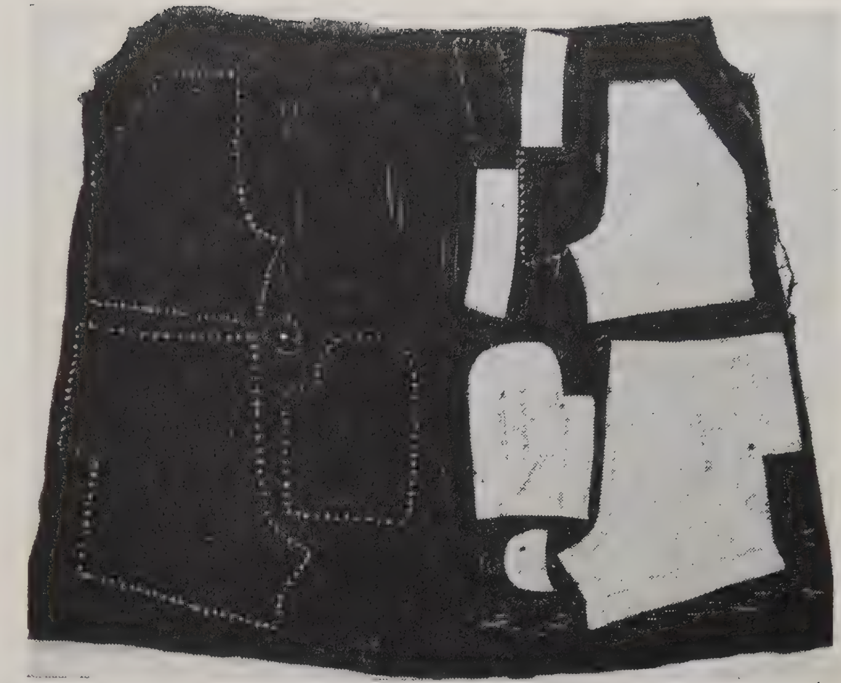
the old pieces. Look at the diagram of the parts of the new pattern and see if they will be likely to fit in with your cloth. When the material is ready for working lay it flat on a large table and mark the places which have to be avoided when cutting out. Lines made with tailor's chalk will be a good guide on dark materials, but when these markings will not show up well run tacking stitches in coloured cotton round the areas to be missed.

Now take up the pattern pieces and try them for the best position on the material, making sure that the cloth runs in the right direction as marked on the pattern. Many failures in remaking start here; the pattern pieces are placed askew and the remade garment drops and puckers at the seams. Try to avoid all the worn places when cutting out, but if a small blemish mars an otherwise good piece, endeavour to arrange the pattern so that the mark comes in an inconspicuous place or where there is less strain on the garment in wear. Small corners of seam allowances can be ignored if they extend beyond the material, provided there is enough left to hold when the garment is stitched.



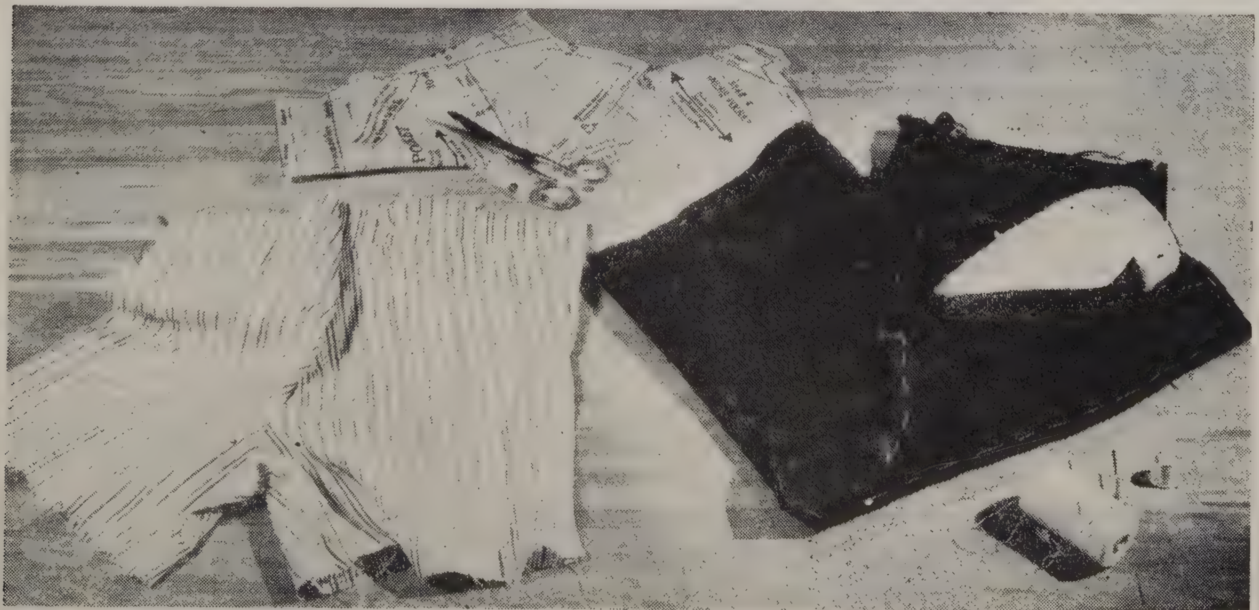
Pattern sections set out on the old gym tunic.

[*Sparrow Industrial Pictures photo.*

THE BOY'S OUTFIT

The Shorts

Making a woollen garment is not exactly a job for the novice, so the first attempt at "making over" should be something fairly simple. Little boys' trousers are not quite so complicated as some garments and will make a good conversion on which to start if the needlewoman has not had much experience. The navy shorts illustrated were made from a school gym tunic, very worn down the edges of the pleats and at the hem and badly faded across the yoke. The sides furnished sufficient really good material for two pairs of the shorts. They have inset pockets and the pattern is in six pieces, which is an advantage, as the several smaller good bits of cloth were easier to find than the larger ones. The lining for the trousers was made from the best parts of a worn-out shirt, though clean washed flour bags, parts of cotton frocks, house smocks, pyjamas or short lengths of material left over from sewing would have done equally well. The facings for the pockets and flap were cut from the navy serge, and the pocket linings were made from a small piece of left-over calico. The tunic was unpicked and prepared for remaking as described earlier. To avoid the faded parts across the pleats it was turned inside out and the wrong



Trousers during making.

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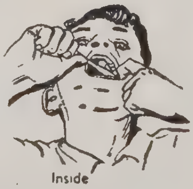
- Healthy gums are firm and pink.
- Small-head toothbrushes are excellent for reaching all tooth-surfaces.
- Rinse the mouth vigorously several times after brushing.
- Use *cold* water for brushing and rinsing — not warm or hot water.
- Hang brushes to dry in a sunny, airy place. Let each brush have its own hook.



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side became the right side of the new shorts. All the worn parts of the front pleats were missed by putting the larger pattern pieces on the sides as shown in the photograph. Note the marking round the worn patches which were not to be used when cutting the trousers. Most commercial patterns give full directions for making up the garments and each step should be carefully followed. Remember to keep the iron hot while working and press each seam well under a damp cloth as soon as it is stitched. The cross seams will lie flat and the finished garment will look much better if this "press-as-you-go" rule is observed.

The Shirt

The small shirt was cut from a discarded "grown-up" one. There were several worn places and tears so that the back of the boy's shirt had to be joined down the centre, as there was not a sufficiently large area of good material to cut it in one piece. The stripes were matched carefully and the result is an inconspicuous join. If the material had been a plain colour, an inverted pleat could have been arranged, and by making the join coincide with one fold of the pleat the piecing would have been hidden. When these joins or piecings are unavoidable in remaking garments try to arrange them to come where they won't show. Facings can be pieced below the point where they turn back, under-sleeve parts can be joined in length or width, and bodices can have a yoke or be joined at waist and underarm. Both of these re-makes are comparatively easy, and even if you haven't had much experience, the results should be very satisfactory.

General Hints

You will be eager to try your hand at something more complicated, so keep these points in mind:—

Make sure that the clothing is no use as it is, and that even if repaired it would still be unwearable.

See that there are enough good parts to give sufficient sound material for the new garment.

Be certain that the pattern is a good fit.

Always lay the straight of the pattern true with the grain of the cloth.

Take care to cut the right number of pieces and reverse the pattern where necessary.

It is always better to cut each part separately so that worn areas can be avoided, but do remember to reverse the pattern and check each time to avoid cutting two identical pieces when there should be a right and left part.

"My Favourite Flower"

THE Queen of Flowers still retains her sovereignty where the majority of garden lovers are concerned, but despite the popularity of the rose, quite a number of competitors chose some other flower as their favourite.

The first prize is awarded to "Country Lifer," Wairoa, and the second prize is shared equally by "Cloudy," Ashburton, "Arethusa," Cambridge, and "Faraway," Gisborne. Highly commended, "Homespun," Feilding.

"THE Queen of Flowers has an appeal all its own, and speaks a mute language by which none can fail to be charmed. No more delightful ornament can be found in home or garden; so let us pay our homage to this royal creation, and spread the influence of its divine beauty. . . ." (The Rose Annual).

—"Red Rose," Te Rore.

[Green and Hahn photo.

First Prize

THE rose, our English national emblem, has always been a favourite of the poets, even Chaucer falling under its spell with his "Romaunt of the Rose." Painters have been inspired by its loveliness, the songs of many generations have been filled with its praises. And so I feel that I am in goodly company when I give it all my heart, when I write of its supremacy over the flowers of the garden or the hedgerow, and what it means to me.

I adore roses. From the careful planting of the cuttings or tiny bushes to their final flowering, I find them a source of endless wonder and interest. The riotous masses of colour and scent that are my roses in early summer are a perpetual delight to me. I feel that the roses give my garden a dignity and splendour such as it would gain from no other flower. And at night, when darkness has stolen their brilliance, the moonlight keeps them lovely—so lovely, that I was moved to join the poets and write while the moon's white magic lay upon soil and flower and tree:

"Roses rimed with its silver frost
Spill their fragrance on the gentle air."

Rose-shows exert a never-failing fascination over me. The sight of these elegant beauties standing proudly in their places, their shape and texture something to dream about, their colourings a miracle, is recompense for the difficulties I encounter. But I love all roses. The humble wild ones of the hedges, the briar roses of the wastelands with their simple form and sharp-scented leaves, these are my friends, too. The stately standard, the friendly polyanthus, the blousy cabbage roses, all have their special place in my heart.

I have memories, sentimental perhaps, such as every woman has, bound up for me with the beauty of roses. A bowl of yellow roses on the breakfast table on a sunny morning, their bright petals giving back the sun's golden rays—this is a sight to help us on our way, to imbue our monotonous living with a soul-stirring excitement that brings us a little closer to God. For I believe with the Manx poet, Brown, that

"A garden is a lovesome thing, God wot!
Rose plot, fringed pool.
Not God! in gardens! when the eve is cool?
Nay, I have a sign;
'Tis very sure God walks in mine."

—"Country Lifer," Wairoa.

Second Prize (equal)

PROBABLY it is a whimsical fancy on my part, but I like to think that many of our well-known flowers possess names characteristic of the flower itself. Rose is typical of clean-cut, sturdy British beauty; lavender is a fragrant word; poppy has a drowsy sound; there's a foreign air about the flaunting dahlia; chrysanthemum is truly of the flowery Orient; gazania is a sun-lover; pansy calls up a mental image of the glowing colours of rich velvets; and the lilac, my favourite flower, is a lilting Old World melody.

Always I have welcomed lilac time. The delicate, misty mauves and the pure white trusses of flowers framed in the tender green of new leaves, the sometimes subtle, sometimes heady perfume, and the all-too-brief blossoming make an indescribable appeal. From the first opening buds till the falling florets stud the grass like an ancient Persian carpet in tones of purple, rust, white, and green; through the darker leafage of summer to the bare tracery of twig and stem against a wintry sky, their beauty powdered with snow, I love the lilac.

Lilac in bloom is a joy to behold and a perpetual memory of delight. It is the quintessence of innocence. It is a litany of lovely things—life itself, romance, joy, serenity, friendship. It recalls an Old World charm and courtliness, a world where there are graceful ways and lovely ladies dance a minuet to music played on a tinkling spinet. Some day I hope to have a lilac walk in my garden and there, on moonlight nights when the air is drenched with sweetness, I'll picture the ghosts of my ancestors wandering at will in their rustling silks and satins while the haunting melodies of bygone days are heard in the distance.

—"Cloudy," Ashburton.

Second Prize (equal)

IT was in a slum area of the town. The houses pressed closely together as if for warmth as a chill wind rushed up the narrow street and whistled through the broken panes of glass in the house opposite. Everything depended on this little while, whether that child in the cot should live or die. She was lying quietly now in the battered old cot that was too small for her. We had done all we could. Now we waited.

Before anyone realised what had happened a little Maori girl had slipped in through the half-open door, thrust a grimy hand through the bars of the cot, and was gone down the stairs like a streak. I bent over the ailing child and clutched in her hand was a tiny snowdrop. Slowly she moved her head and her eyes lit up. I could only just catch the hoarse whisper, "The firs' fairy."

After that I was a frequent visitor to the house and my young patient grew better every day.

"Look," she said, as I sat down to chat to her. She held up something very small, and very dead. It was the snowdrop. "You see," she went on in the quaint way she had, "It grewed up in the cold just for me. Me an' Mona call them fairies."

Then she told me the story they had made up about the flower. There once lived a beautiful fairy with a pretty white skin, who loved to wander in the cool trees which grew in the big forest where she lived. One day she wandered further in than she had ever done before, so far that she was on the land of a wicked old witch who was so angry when she found the fairy had dared to tread on her land that she changed her into a flower. So pure and sweet the fairy had been, that she changed into a beautiful white blossom with green spots of the woodland on the bottom of her dress.

"And," she finished breathlessly, "'Stead of growin' them big flowers like the swells do, I'm goin' to grow these an' give 'em to all the little kids as wants 'em."

That seemed a tribute to the snowdrop. It may not be as sweet as the violet, as beautiful as the rose, or as valuable as the orchid. It is not for great halls or palaces, but it will grow in some little place where it seems no friendliness is left, in the cold hard soil. In its frailness and its purity, this tiny messenger, which braves the last bitter winds of winter, to tell us spring is almost here, holds the first place in my list of favourite flowers. **—"Arethusa," Cambridge.**

Second Prize (equal)

SHE stands before me as I write—my favourite flower. Her long sturdy stem drinks water from a crystal vase, and her head is held proudly erect, for she is the "queen of the garden."

Dark ruby red, with petals of velvety softness, she sends little sighs of perfume to me sitting in wonder and humility at such creation of beauty and perfection. I draw nearer and, with a deep breath, inhale the exquisite scent. Again, and yet again.

How well I know that by tomorrow the proud heart will open and the bud will merge into the full flower. The inner petals will glow, and the velvet sheen take on deeper shadows. Oh, heart of beauty. Oh, fountain of sweetness! No other flower has so touched the soul of poets, and songs without number have been written for you.

I love you best, because you come to me when summer is but a promise. You respond so willingly to my care, and your beauty is always so fresh, and your charm unending. You leave me, only when the first suspicion of winter appears, and I treasure you for weeks of undiluted joy. Even your sharp little thorns become endeared to me, for, with perfect love, there is no fear. You are, in very truth, "queen of the garden," and so old that in the "Good Book," in Isaiah, we read, "The wilderness and the solitary place shall be glad for them, and the desert shall rejoice, and blossom as the rose."

Competitions

MARCH

The essay subject for March is "My Pen-name." Entries close on March 15.

APRIL

All of us have our likes and dislikes. Concerning the latter, there is sure to be one thing we loathe more than others. Some folk may select spiders, or sago pudding, or scarlet-painted fingernails as coming under this heading; to others, cockroaches, or crooning, or crumbs in the bed may constitute a crowning aversion.

My own particular antipathy is directed towards mice—what's yours? Closing date, April 15.

"MY PET AVERSION"
First prize, 10/-; second prize, 5/-.

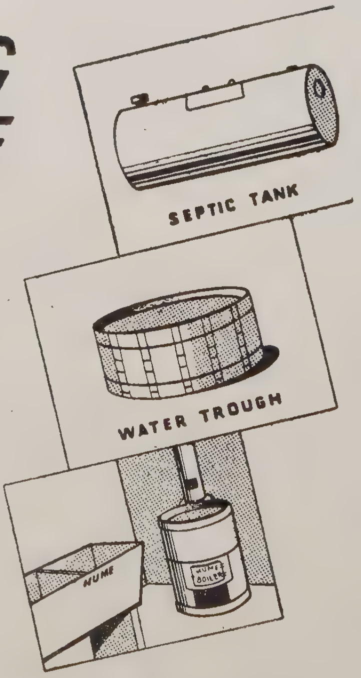
MARY,
"Journal of Agriculture,"
Box 1004, Wellington.

Your name, fair charmer? It comes from a source of which I know nothing, but surely she whom I salute is a very gracious lady—my rose, "Mrs. Hugh Dickson."—**"Faraway," Gisborne.**

Highly Commended

ALL flowers are lovely, but to me none is so beautiful as the Madonna lily. It is known as the Christmas lily out here, but the other is its true name—a name which adds dignity and grace to a perfect flower.

Possibly there is some famous painting of the Madonna holding these lilies which gave the flower its name. It has been cultivated for many hundreds of years, for a painting of the Madonna by Van Eyck in the early 15th century has these lilies growing in the garden which forms a background to the lovely figure.



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Rossetti mentions them in his poem "The Blessed Damozel."

"The blessed Damozel leaned out
From the gold bar of Heaven;
Her eyes were deeper than the depth
Of waters stilled at even;
She had three lilies in her hand,
And the stars in her hair were seven."

A retired clergyman friend whose hobby was gardening had one of the most peaceful gardens I know. It was surrounded by a board fence which in June was completely hidden by Madonna lilies. There must have been hundreds of them with their pure white trumpets and yellow stamens, and the garden was filled with their perfume. My friend said he had started with one hundred bulbs and divided them each year until they made a perfect background for his garden.

Rose Perfume

A rose in a gown of yellow,
A rose in a robe of white,
In a vestment softly mellow,
In a garment satin light;
A rose in a drape of orchid,
Or dark as a cavern's gloom;
But the whole world knows
And worships a rose,
Because of its rose perfume.

A rose in a wrap of amber,
A rose in a crimson shawl,
A rose in a cream-dyed raiment,
Or gold as an elm in fall,
A rose like a torch for beauty,
A rose like a dream abloom;
But the whole world grows,
To worship a rose,
Because of its rose perfume.

—L. M. Thornton.

I think it was when I saw them growing there so stately and tall that I fell in love with them, and no other flower has taken their place since. I have only one in my garden now, but I hope I shall be able to give a glimpse of beauty to someone in the years to come.—**"Homespun," Feilding.**

MY favourite flower is the narcissus because it has so many charming varieties. Unless one buys the very expensive bulbs it is not costly to plant. It also flowers very early in the spring and over a fairly long period.

When I was a child my father had another farm five miles from our home. It had been an old priory and the monks (how long before?) had planted the pheasant's eye narcissus in their garden. Every spring we had a picnic there and used to go under an ancient arch and past an old dovecote to gather these lovely flowers which were still growing there in abundance.—**"Hannah," Hastings.**

ROSES are my choice for their fragrance and beauty. The following poem, culled from Rita Snowden's book, "While the Candle Burns," describes my favourites:

My garden has roses red,
My garden has roses white,
But if when the day is sped
I stand by the gate at night,
One fragrance comes, when the day is aead,
From my roses white, and my roses red.
The roses of joy are red,
The roses of pain are white;
But I think when the day is sped
And I stand by the gates at night,
I shall know just this, when the day is dead:
That a rose is sweet, be it white or red."

—"Easterly," Canterbury.

IN some species of delphiniums there is the iridescent sheen that can be found on the peacock's tail, or in the flashing feathers of the kingfisher. As long as I have a garden I shall plant clumps of delphiniums in sheltered borders, to lift my drooping spirits on "blue" days and give my modest collection a little air of importance that other cherished but less upstanding members of my flower community seem to lack.—**"Francisca," Westland.**

I LOVE fuchsias best. What a wealth of glorious colour combinations in their graceful blooms. Though they are summer flowers, there was never a day last year when I could not pick enough fuchsias to fill my floating bowl. Some of the varieties have fascinating names. For instance, there is "Ballet Girl"—she has a snow-white bodice and a full red skirt. "Dresden China" and "Bridal Bouquet" have dainty pale pink and white blooms; "Fire of the East," with its two shades of glowing red, has quite an oriental appearance, while the salmon pink and orange flowers of "Pride of the Market" make it a fuchsia anyone might be proud to own. I have fifty different kinds, but some nurserymen claim over three hundred. The smallest flowers measure barely half an inch across, the largest from four to five inches, while the bushes themselves vary in height from a few inches to six or seven feet.

One can buy fuchsia plants from a florist, but it is much more fun to grow them from slips, as they strike very easily. For any one who wants a good hobby I recommend them to try growing fuchsias.

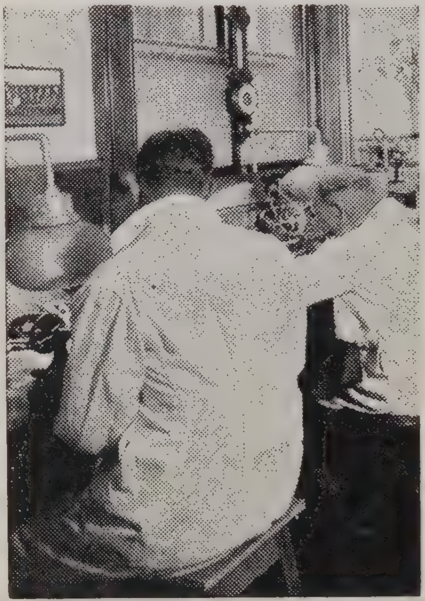
—"Aranui," Lowry Bay.

Golden Glories

The buttercup is like a golden cup,
The marigold is like a golden frill,
The daisy with a golden eye looks up,
And golden spreads the flag beside the rill,
And gay and golden nods the daffodil;
The gorsy common swells a golden sea,
The cowslip hangs a head of golden tips,
And golden drips the honey which the bee
Sucks from sweet hearts of flowers, and stores and sips.

—Christina Rossetti.

IT is difficult to decide when a rose is most perfect: when it emerges from its sheath and gradually unfolds layers of soft petals in response to the sun; or when it is in full bloom and you can see right into its heart. You wonder if they feel approaching death, for unlike most flowers, roses die gradually, shedding one petal at a time. You think of them flowering in the morning with a light sprinkling



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of dew upon their delicate petals, and at dusk when their scent permeates the whole garden. You consider their infinite varieties and colours and sizes, from the richness of John Dickson to the small Swiss rose whose plant is only two inches high and has blooms the size of a bead. Yes, roses will always be my favourite flowers. They remind me of the words of another, who said: "If I show you a rose, you will not find fault with God any more."—**"Alison Grey," Tauranga.**

IN front of me there is a bowl of lovely, scented sweet peas, all delicate colours of blue, mauve, pink, cerise, and carmine. They are my favourite flowers, without a doubt. They are not much trouble to grow; they have a long period of flowering, and as I do not possess a willowy figure, I find it an advantage not to have to bend to pick them!—**"Pansy Seed Picker," Blenheim.**

LEGEND OF THE MOSS-ROSE

The angel of the flowers one day
Beneath a rose tree sleeping lay;
That spirit to whose charge 'tis given
To bathe young buds in dews of heaven—
Awaking from his light repose,
The angel whispered to the rose:
"O fondest object of my care,
Still fairest found, where all are fair;
For the sweet shade thou giv'st to me,
Ask what thou wilt, 'tis granted thee."
"Then," said the rose with deepened glow,
"On me another grace bestow."
The spirit paused in silent thought—
What grace was there that flower had not?
'Twas but a moment—o'er the rose
A veil of moss the angel throws,
And robed in Nature's simplest weed,
Could there a flower the rose exceed.

—(Author unknown).
—**"Native Flower," Waipukurau.**

THE pansy is with us all the year round. It brightens up the odd corners with its many colours and faint fragrance, and reminds one of an old and trusted friend, always there to come back to.—**"Mary Ann," Bell Block.**

I CAN still see in my "inward eye" a long curving border of lavender, grey and green at the bottom and a tremulous mass of rusty lavender at the top. Bees buzzed busily around it and moths hovered above it. It was not spectacular, but there was something very peaceful and satisfying about it. What a number of uses lavender has. Lavender sachets have scented English linen for generations; lavender water is a perfect scent for all occasions; and the stems which have been clipped off in pruning diffuse a delightful fragrance when they are thrown on an open fire, and bring back memories of summer days and scenes.

In the words of the old street sellers of flowers: "Where shall you find such a sweet and lovely flower as this which I bring to your door every year?"—**Lavender," Tauranga.**

ICELAND poppies bloom all the year round without stint in a reasonably sheltered spot, and how their lovely tints blend in soul-soothing harmonies. "Concerto in Colour" aptly describes a bed of these poppies. For grey days they are a tonic; for blue ones, inspiration.—**"Mum," Lake Waitaki.**

DURING the Indian Mutiny a young couple pursued by the sepoys through the Residency garden came upon a maker of rose essence. He advised them where to hide and refused to tell their pursuers where they had gone, but unfortunately a piece of the lady's dress caught on a bush and the sepoys came back and slew the perfume-maker. Years after, the two whose lives he had saved returned and raised a monument to him, inscribed:

"Only the action of the just
Smells sweet and blossoms in the dust."

—**"Shalton," Matamata.**

MY favourite flower is singularly unassuming, but excels all others in its matchless fragrance, which pervades the air from its dozens of florets borne erect on each tiny flower stem. It even has a colour scheme all its own—reseda.

Though it possesses no cloying sweetness, it charms even as orris and incense. Early in the morning, dew-sprinkled, its unmistakable perfume is especially noticeable. Later in the day bees swarm and hum happily over the beds, attracted by the exquisite sweetness diffused upon the sun-warmed air. But it is at its best when the shades of night fall softly upon the garden and the fragrance becomes intoxicating in the cool atmosphere. Its name, too, is singularly appropriate —mignonette, "little darling." Truly, I love sweet mignonette, not only because of old memories but for its own dear sake.—**"Reseda," Papatoetoe.**

YELLOW

Nature rarer uses yellow
Than another hue;
Saves she all of that for sunsets—
Prodigal of blue,
Spending scarlet like a woman,
Yellow she affords
Only scantly and selectly,
Like a lover's words.

—Emily Dickinson.

Call what you will your favourite flower,
But whisper, lest the radiant shower
Of those less treasured fades and dies
In sad remorse before your eyes.

—**"Native Flower," Waipukurau.**

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WHAT DRASTIC RATIONING REALLY MEANS

By DOROTHY JOHNSON, Rural Sociologist, Christchurch

MANY references to rationing standards abroad and to the grim food prospects for the millions in Europe, India, China and elsewhere appear in newspaper cables these days. This article, in showing the weight of foodstuffs needed to provide these rations which may now vary from 1,500 to 2,800 calories a day (but which have sometimes fallen as low as 400 to 500 calories) makes it abundantly clear just how well off we are for food in New Zealand measured by many other countries.

THE welfare of the family is largely in the hands of the one who provides the "three meals a day"—those meals which, to the housewife, often seem so appalling in their inevitability. In primitive and in pioneering times the source of the next meal was often uncertain. The war has again brought this uncertainty to millions of people. New Zealanders have escaped that bitter experience; we still make our choice from a wealth of materials; we still plan meals for our families and our guests, often with new dishes in mind to charm the eye and to delight the palate.

But we are aware of these contrasts—both personally and nationally—and we are not an ungenerous people. Our butter, meat and sugar are rationed so that more may go to Britain. In addition, essential foods from our individual rations are sent as gifts to friends and relatives abroad. To keep fit, and yet be able to send still more food abroad to those for whom the consequences of war mean suffering greater than we will experience, we need a more widespread knowledge of the principles which should underlie the daily choice of meals. We must apply this knowledge.

IN EUROPE

Consider food as a source of energy. In Amsterdam and Rotterdam, it was officially stated a few months ago, the people were getting no more than 450 to 500 calories a day. In Belgium and liberated Holland, the ration gives 1700 to 1800 calories a day. In European internment camps, the basic ration was 1200 calories a day in 1940, but it was reduced to 845 in 1943. In October, 1945, Field-Marshal Montgomery stated that he was aiming at a ration of 1500 calories a day for German civilians. They have been getting an average of 1200 calories a day, compared with the British civilian ration of 2800 calories. UNRRA is aiming at the goal of 2650 calories per person per day in the countries in which it is operating.

What do these statements mean in terms of the amount of food each person gets in one day to supply the energy he needs?

Practically everything we do requires energy, even sleeping, for the heart, the lungs, and the digestive organs must still function. Mental work alone has not been found to cause a measurable expenditure of energy, apart from the physical movement which it entails.

A man lying motionless in bed, doing difficult calculations in his head, cannot be shown to use any more energy than if he were lying there with his mind more or less blank. It is difficult to persuade mental workers that this statement is true.

Unrationed

We don't need coupons for kindness,
It is a joy which we all can share.
We don't need coupons for sympathy
That helps everyone everywhere.
Let us face our troubles with cheerfulness
And courage for all our needs,
Develop our love with prayerfulness
And turn it to practical deeds.
Charity, too, is unrationed.
Its store is unending and free,
And though as a word it's old-fashioned,
Its meaning is clear as can be.
These gifts are a storehouse of treasure
On which we may draw without end.
God has given them free without measure
So that we each may share with a friend.

—"I.H.R.", Whata Whata.

Our energy requirements may be estimated with some degree of accuracy when our age, sex, size, and activity are known. This energy is normally obtained from our food, but if food is withheld it is obtained by the burning of our body tissues. These body tissues are replaced again when more food is available, provided the process has not gone too far. It is in this ability to use its own substance for fuel that the body differs from a machine or heat engine, but its output of energy can be measured as accurately as any engine's.

ENZYMES AND HORMONES

All engines which burn fuel to supply heat and energy burn it at a high temperature. Substances used for human food could be burnt to drive a steam engine, but at a temperature our bodies could not withstand. In our bodies they are burnt at body temperature, 98.4°F. or 37°C. This is accomplished by the aid of some complex substances within the body called enzymes and hormones and of others in the food, namely, the vitamins. The constituents of our diet which directly produce the heat and energy are the proteins, the fats, and the carbohydrates (the starches and sugars). Both the engine and the human body require oxygen to burn up the fuel, and one of the products of this combustion is carbon dioxide. By measurement of the oxygen consumption and the carbon dioxide given off, a direct estimate of the energy requirements for various tasks can be obtained.

This energy is measured in units of heat called calories. Just as units of distance are called feet and yards, and units of weight are called pounds and ounces, so units of heat are called calories. In nutrition, the greater or kilogram calorie is used. This means the amount of heat required to raise the temperature of 1 kilogram (2⅕lb.) of water, 1 degree Centigrade, almost the heat needed to raise 1lb. or 1 pint of water 4 degrees Fahrenheit. In everyday measures, 24 calories represents about the difference in heat between a cupful of water out of the tap and a cupful of boiling water. Also, a 60-watt electric lamp or a burning candle gives off 60 calories of heat in an hour. Again, an average-sized man lying at rest in bed produces 65 calories of heat per hour, or sitting still spends just about 100 calories of energy in the same time.

How many calories of food energy do we need daily? As a result of years of research, scientists have found that everybody needs a certain number of calories daily, just to keep alive and to carry on the internal work of the body, or to supply the energy to keep their hearts, lungs, and digestive systems working even when they are asleep. In addition, they need a certain number of calories of energy to spend on work and play—the nature and the amount of which determine the number.

Dr. Sherman, of Columbia University, said that a normal average-sized man living entirely in bed or on an easy chair would require about 2000 calories a day. He could easily double the day's energy output by eight hours' hard muscular work. We may

PARENTS and the SCHOOL CERTIFICATE

The measure of a good secondary education

The School Certificate is proof that a boy or girl has completed a good secondary education. The School Certificate Examination is ordinarily taken at the end of three or four years at a secondary or technical school. It is of the same standard as the old University Entrance ("Matriculation") Examination, but the choice of subjects is much wider.

For the School Certificate, a pupil can take a course adapted to his own special abilities and his future occupation. This means that the Headmaster and the parent, taking the child's own wishes and abilities into account, can select from a number of courses of study one which will not only give a good general education as a preparation for citizenship, but will also be a preparation for a chosen career.

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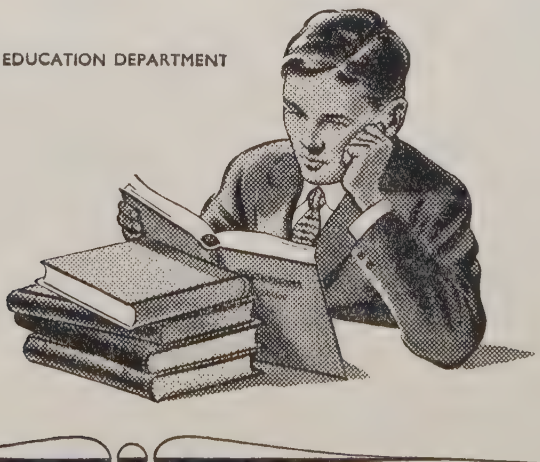

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safely add up to 75 calories per hour for light work performed, 75 to 150 for moderate work, and 150 to 300 for hard work.

CHILDREN'S NEEDS

The Committee on Foods and Nutrition of the National Research Council (U.S.A.) issued a table (Table I) as a guide in estimating the needs of children of different ages and adults of various occupations. Children and adolescents require a great deal more energy than adults in proportion to their size. Healthy children should be active whether or not their parents are. Farm women, nurses, typists, postmen, and carpenters are considered to do "moderately active work." They need, if they weigh about 125lb., 2500 calories per day. For each 10lb. above or below the weight quoted, 150 to 200 calories are added or subtracted. For example, a moderately active woman whose normal weight is 145lb. (10st. 5lb.) would perhaps require 2800 to 2900 calories per day instead of 2500 as suggested in the chart.

TABLE I.

Food and Nutrition Board, National Research Council, U.S.A.

RECOMMENDED DAILY CALORIE ALLOWANCES

	No. of Calories (Approx.)
CHILDREN (age in years):	
1 to 3	1,200
4 to 6	1,600
7 to 9	2,000
10 to 12	2,500
GIRLS:	
13 to 15	2,800
16 to 20	2,400
BOYS:	
13 to 15	3,200
16 to 20	3,800
WOMEN (weight about 125lb.):	
Doing sedentary work	2,100
Doing moderately active work	2,500
Doing very active work	3 000
Pregnant (latter half of pregnancy)	2,500
Nursing	3,000
MEN (weight about 155lb.):	
Doing sedentary work	2,500
Doing moderately active work	3,000
Doing very active work	4,500

We can now understand what newspaper statements mean when discussing food prospects for the people in Europe, in India and in China.

> **Many adults are living (or dying) on half the food sufficient for a child from one to three years of age. The length of time they can hold out depends upon the resources of their body tissues, which were not so great, even before the war, as those of people in countries with a high standard of living like our own.**

Dr. Bourne, Professor of Biochemistry, Cambridge, in his book, "Starvation in Europe," stated that before the war 30 per cent. of the people were undernourished. Unfortunately, on a low calorie diet there is a strong possibility that the food will be inadequate to preserve good health apart from the aspect of energy.

How many calories of energy have we at our disposal from our breakfast, lunch, and dinner, with the three extra meals at morning and afternoon tea, and supper? The amount of available energy obtained from a given weight varies from one food to another. The energy values to the body of the chief nutrients are as follows:

Starches and sugars, 4 calories per gram or 1814 calories per lb.

Fats, 9 calories per gram or 4082 calories per lb.

Proteins, 4 calories per gram or 1814 calories per lb.

When we know the composition of any food, we know from this table how many calories it can yield.

Table II shows the percentages of the chief nutrients and the total energy value of 1lb. of a few typical foods.

TABLE II.

(Abridged from U.S.A. Dept. of Agriculture Bulletin No. 546)

THE PROTEIN, FAT, CARBOHYDRATE AND ENERGY VALUES OF 1lb. OF SOME TYPICAL FOODS.

Food.	Protein (In Grams)	Fat (In Grams)	Carbohydrate (In Grams)	Energy Value (in Calories)
Apples ..	1	2	59	260
Bananas ..	4	0.5	70	300
Beef ..	78	54	0	800
Bread (wholemeal)	41	14	224	1185
Butter ..	3	367	2	3325
Cabbage ..	4	0.5	18	90
Cheese ..	108	146	8	1785
Eggs ..	52	46	3	635
Fish (cod)	52	1	0	220
Milk ..	16	18	22	310
Potatoes ..	8	0.5	73	325
Tomatoes	4	1	18	100

Fats are more concentrated forms of energy than other foods. In addition, they add flavour to foods and give them that quality of "sticking to the ribs" or satisfying hunger for several hours, which hard-working people appreciate. For the complete burning of the fat in the body, some carbohydrate is necessary. The age-old custom of combining starchy foods with fats—as in bread and butter, biscuits and cheese, porridge and cream—is a thoroughly sensible one. We look chiefly to the starches, sugars, and fats for fuel because not only are protein foods more expensive, but it is not wise to eat more than the amount required to meet the body's needs. Someone has remarked that using protein foods for fuel is like burning good furniture in the kitchen range.

DULLS THE APPETITE

Sugar is a ready source of energy, but sugar—rich or sweet foods—very quickly satisfies and dulls the appetite so that mainly calories are supplied. There is often no appetite left for the meat and vegetables and fruit which supply fundamental needs. As sugar is also an irritant in the stomach, it is better to select energy-giving carbohydrates from among the starchy foods. Very sweet foods should be used sparingly and towards the end of a meal.

Song

For every tree that grows within
The shadow of the hill
And every puny weed and shrub
That draws life from the earth
And every little greenery
That has its bud and flower
Need not have had their tender grace
When they were given birth.
For He need not have given flowers
To bless the fields and lane
Or delicate small shoots
To burst wide in the Spring;
And yet He made these waxen things
And hung them in the trees
And then of dust He made a bird
And taught it how to sing.

—Roma Hendon.

Active work burns up the fuel foods quickly. Sometimes a few minutes' relaxation and a bite to eat during a busy morning or afternoon's housework or shopping will renew energy and keep people from reaching exhaustion point. In New Zealand, people scarcely need that advice, but it is pleasant to know there is some justification for our habits.

A "piece" after school for the youngsters may avert quarrels and general "naughtiness" that are likely to come from tiredness and depleted energy. When we hear unmistakable signs of a quarrel late in the afternoon, it is wise to cut some bread and jam and quarter some apples, enter the scene of conflict impersonating the goddess of plenty, and distribute favours impartially.

EUROPEAN RATIONS

The figures in Table II show that 1lb. of bread, ¼lb. butter, and 4oz. cheese will give women practically their day's supply, 2462 calories. With the addition of 1lb. of apples women should have 2722 calories, which is above the figure that UNRRA is aiming at for the people in destitute countries.

German civilians are getting only the equivalent of 1lb. bread (1185 calories) plus 2⅔oz. cabbage (15 calories) per day. Their extra rations of 300 calories for this winter, if obtainable, could be the equivalent of 1oz. cheese (112½ calories), 4oz. potatoes (81 calories), 2oz. meat (100 calories) and extra 1⅓oz. cabbage (7½ calories).

For those in internment camps, an actual day's meals in April, 1943, were, as stated in the Bulletin of the Health Organisation (League of Nations):—

Midday: Soup with 4oz. vegetables. Salad of 1oz. cabbage.

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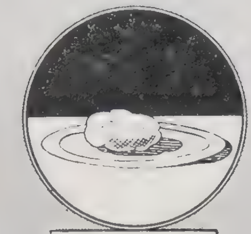
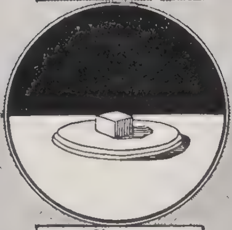
TABLE III—100 CALORIE PORTIONS OF A FEW FOODS (U.S.A. DEPARTMENT OF AGRICULTURE). TAKEN FROM “FOODS.” : JUSTIN, RUST, AND VAIL, RIVERSIDE PRESS, NEW YORK.

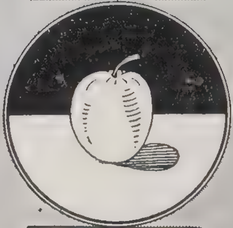

Potatoes
1 medium
5oz.

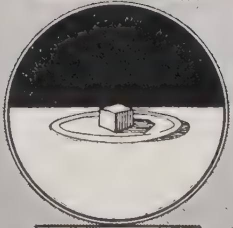
Milk
⅔ cup
⅓ pint

Prunes
3 large
1½oz.

Carrots
8oz.


Cheese
1½ cub. in.
⅘oz.


Apples
1 large
8oz.


Butter
1 cub. in.
nearly ½oz.

Peas
½ cup
3½oz.

Medium Fat
Roast Beef
1 slice: 1½oz.

Toffee
1oz.
3 small pieces

Boiled Rice
¾ cup
4oz.

Eggs
1⅓ medium
2½oz.

Bread
1 thick slice
1½oz.

Tomatoes
1lb.

Sugar
1¾ level tablespoons
nearly 1oz.

Evening: Soup with 4oz. vegetables. Meat 1oz. Vegetables 1oz.

Additional: 8oz. bread and 1 teaspoon sugar daily and a small piece of cheese three times a week.

This fare approximates 745 calories per day.

In assessing or checking the energy value of food it is helpful to know either the quantities of the different foods that will yield 100 calories, or the number of calories contained in a usual helping of a food.

Here are quantities of some typical foods needed to furnish 100 calories. (Table III on the opposite page gives pictures of few more) :—

Butter, about ½oz.—a generous pat.

Bread, about 1⅓oz.—a thick slice or 2 thin ones.

Milk, about 5oz.—⅔ of a full-sized cup.

COUNTRY FLOWERS

As I remember from a dream
The gay rose red and free
Let darkly fall her wanton heart
Slowly, in secrecy,
And every hedge shook down the bloom
Of wild-born honeysuckle white,
And daisies from the summer grass
Flowed up in waves of foam and light,
And blue the sea air down the sky
In drifts where sombre pine-tops part,
And you were coming from the hill
As I have kept you in my heart.

As I remember from a dream,
The country scents so warm and sweet
Weave spells about my head again
Although I walk a city street.
There does not bloom a city flower
That I would walk a mile to seize—
But oh, the rose that grew so free
Upon a road beneath the trees!
And not a sight on earth so rare
To send the joy of beauty through me
But you, dark gilliver and fair,
As I remember, coming to me.

—Mary R. Gullery.

Potato, about 5oz. — 1 fair-sized potato.

Apple, about 7oz.—1 good-sized apple.

CONCLUSION

In New Zealand we are indeed fortunate to have plenty of food. It may be difficult for us to visualise fully the meaning of "freedom from want." A general report on the first session of the conference of the Food and Agriculture Organisation of the United Nations opens with the following statement:—

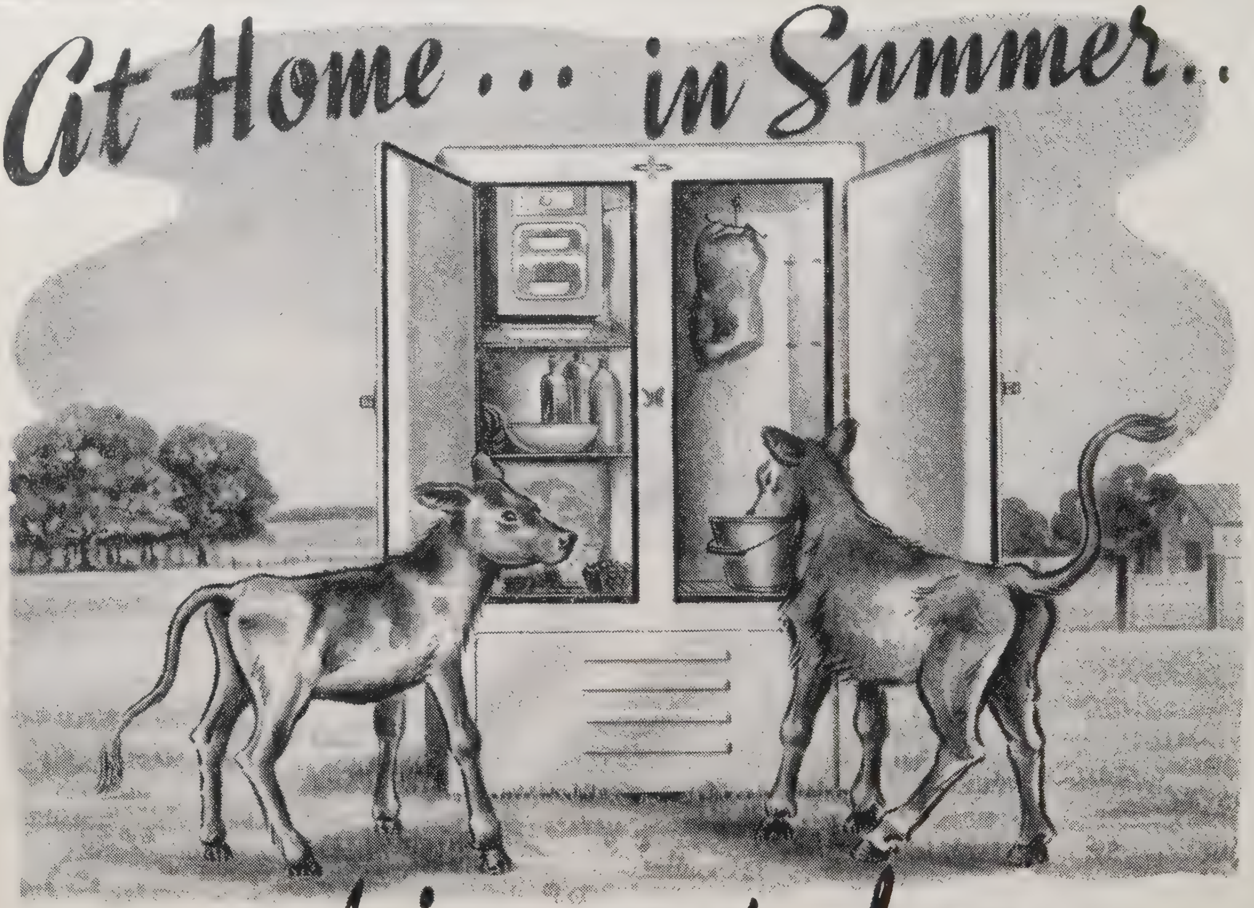
"The Food and Agriculture Organisation is born out of the idea of freedom from want. This is not one man's fortunate phrase; it expresses an aspiration as old as mankind. Whenever primitive men tried to imagine paradise in concrete terms, they pictured it as a place where food was plentiful and want no longer existed. . . . This generation goes beyond the conviction that freedom from want can be achieved and believes that the effort to achieve it has become imperative. The profound depression in which much of the world sank during the inter-war period; the spectacle of millions of unemployed, of ruined farmers, and of hungry people contrasted with the known potentials of modern production; and finally the rise of ugly theories of world conquest and the use of armed aggression as a way out of hard problems, ending in the cataclysm of a second world war — these events have convinced men that the world's resources must be better used for human welfare and that nations must work together rather than at cross purposes, or our civilisation may go down to destruction."

TABLE IV.

(From "Kitchen Course in Nutrition," by Julia Lee Wright)

CALORIE CHART.

Food.	Measurement.	No. of Calories.
BREAD:		
White	1 slice (1oz)	70
Wholemeal	1 slice (1oz)	68
Biscuit (water)	1	12
Biscuit (wheatmeal)	1	42
CEREALS:		
Flour, wholemeal	1 cup	479
Flour, white	1 cup sifted	403
Macaroni, cooked	½ cup	89
Oatmeal, cooked	½ cup	66
Rice, cooked	½ cup	93
DAIRY PRODUCTS:		
Butter	1oz.	208
Milk (whole)	1 cup	184
Milk (skim)	1 cup	74
Cheese	1oz.	112
Cream	1 tablespoon	60
Egg	1	74
FRUITS (raw):	Average	60
Apples	1 (¼lb.) 2in. diam	65
Apricots or plums	3 average	60
Bananas	1lb.	300
	6½in. long	99
Grapes	20 or ½ cup	78
Oranges	1 2½in. diam.	51
Peach	1 medium	51
Raspberries or strawberries	1 cup	64
FRUITS (cooked):		
Apricots, pears, peaches	3 halves *plus* 2 tablespoons juice.	100
Apple, baked	1	150
FRUITS (dried):		
Dates	1 large	25
Figs	1 medium	15
Prunes	1 medium	25
Raisins	¾ cup	345
MEAT:		
Beef	4oz.	200
Pork	4oz.	265
Steak	4in. x 4in. x ½in.	300
Poultry	2 slices 3½in. x 3in x ¼in.	260
MISCELLANEOUS:		
Peanut butter	1 tablespoon	100
Chocolate fudge	4 1in. cubes	372
Jam or marmalade	1 tablespoon	77
Salad dressing	2 tablespoons	180
Sugar	½ cup	400
	1 teaspoon	17
Cake	1 small piece	100
Ice cream	½ cup	190
Apple pie	1 serving	300
Mincemeat pie	1 serving	450
VEGETABLES (fresh-cooked):		
Asparagus	12 stalks	26
Beans, string	½ cup	28
Beetroot	2 2in. diam.	40
Brussels sprouts	7 1½in. diam.	58
Cabbage	¼lb.	23
Carrots	¼lb.	45
Cauliflower	1 cup	31
Celery	4 medium stalks	22
Lettuce	1 large head	50
	1 large leaf	3
Onions	4 small 1½in. diam.	64
Parsnips	½ cup	65
Peas	¼lb.	53
Potatoes	¼lb.	81
Pumpkin (cooked)	½ cup	35
Tomato	¼lb.	25
VEGETABLES (dried):		
Beans—Haricot, lima	½ cup cooked	110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The Pet Thrush

YOUR article on birds prompted me to tell you about the pet thrush we had. Last January my daughter Anne from her bedroom window watched a pair of thrushes building their nest in a tree. From time to time I was given excited accounts of the little family's doings. First, three eggs were reported, and then, one day, there were three baby birds in the nest. But that night a strong, gusty wind tossed the trees and played havoc in the garden. Early next morning Anne went hurrying down to see if all was well with the birds, only to discover the nest upturned and no sign of the occupants. After a long search two barely alive fledglings were found in the long grass and gently transferred to the house. A hot water bottle and warm flannel were used to revive the cold, featherless wee things, but only one survived the night. The bird flourished and grew, and the whole family had to take turns in digging for worms!

We called our pet "Poppy." He was put in an old cage at night, but resided in the kitchen during the day. He had a daily bath in a soup plate, splashing water in all directions and thoroughly enjoying himself. While I cooked and worked in the kitchen he hopped round chirruping and picking up crumbs. I spent half my time cleaning up the mess! He had been with us for three months and we had placed a tiny aluminium ring on his leg for identification purposes, but, adorable as Poppy was, it was clear that a house was no place for a wild bird. So he was launched into the blue heavens. Away he went, flying beautifully. I know it seems incredible, but that evening I heard a "peep-peep" at the kitchen door and when I opened it, there was Poppy! In he came and flew up into his cage. I was breathless with joy and delight.

After that Poppy was let out daily, but always returned. Apparently he regarded our house as his home and he naturally came back to us. Then he started visiting other people's houses, flying inside through an open door or window. Thus he became rather a problem, especially when a neighbour rang to say she had just rescued him from her cat. Poppy was too friendly for his own safety and we reluctantly decided to take him right away and leave him in some native bush several miles from our home. So we gave him a good meal of worms, placed him carefully inside a small box, and took him to the bush. That was the last we saw of our much-loved pet. We have often returned to the spot where he was liberated, hoping to catch a glimpse of a thrush with a little silver ring on his leg, but this time Poppy has really gone.

Anne and "Poppy."

I wonder if any other "Good Neighbours" have had a similar experience. I feed a small army of sparrows regularly night and morning, and if I happen to forget them, one of the boldest comes and peeps in the window. People who have never cared for birds can have no conception of their fascinatingly intelligent response to kindness.—**"Alleyne."**

The virtue of adversity is fortitude.
—Bacon.

FEATHERED FRIENDS

WE did not have as many cherry plums as usual this season, for the young buds were eaten by the wax-eyes just before the big snowstorm came. One tree in particular, which is earlier than the others and generally laden, sported a lonely plum here and there. The tiny feathered creatures came in flights seeking desparately for food, and when they tackled the buds on the plum trees we knew something was brewing. Some of the latecomers were caught in the storm and became bewildered and helpless. There was very little one could do except feed them and take them indoors for warmth.

We saw very few birds about during the spring, for the winter took a heavy toll. The cheeky sparrows fared best, as they are grain specialists and flocked in hundreds to our big shed, boring holes into the bags with their beaks large enough to extract a grain at a time. I love birds and once had a wild tomtit perch on my head. Fantails are particularly fascinating the way they pirouette about. One often comes indoors, swings on the lightshades, flies upstairs to the sunbalcony, chattering all the while, and then returns to the kitchen to see what I am doing.—**"Clara Jane," Rakaia.**

"Upon this leafy bush
With thorns and roses in it,
Flutters a thing of light,
A twittering linnet.
And all the throbbing world
Of dew and sun and air
By this small parcel of life
Is made more fair."

—Sent in by "Darky Top."

GARDEN GOSSIP

But if you'd find a mind at ease,
A heart that will not harden,
Just find a gate that opens wide
Into a little garden.

THE garden is flourishing at present—the weeds especially! Recently I restaked 48 tomato plants. Runner beans, sweet peas, grape vines, and passion fruit have spread themselves in riotous profusion all over the northern and eastern walls. A busy life this, but exciting at times and always interesting.—**"Far North."**

I HAVE had a glorious lot of sweet peas—they are finished now. I made the frame from bamboo and tied it with flax. We are fortunate in having these natural accessories growing on our own place. I like the bamboo for stakes and I strip the flax into bundles and hang them up to dry.—**"E.G.," Auckland.**

MY garden is gradually being completed. What pride one feels when glancing over one's small efforts—increasing the fertility of the soil; extending sections of the garden; dividing up plants; and picturing the results of the improvements for next year. This season I'm aiming at a potpourri sort of garden and I am planting my annuals about a foot apart and interspersing them with hardy perennials, as my flower beds are long and wide. Stocks are the predominant blooms in the garden at present.—**"Clara Jane," Rakaia.**

GARDENING has been very disappointing. Cold winds and lack of sunshine have made everything backward. The spring flowers were marvellous, especially the narcissi and polyanthi, but then, Dunedin has the reputation for producing the best polyanthi in Australasia! The summer flowers are not so fine this season, as climatic conditions have been so perverse. The winter was very mild and boronias were blooming outside from May until the beginning of December. The pity of it is that the life cycle of boronia is so short. There is nothing quite so lovely as the scent of boronia in the air after rain.—**"C.V.W.," Dunedin.**

LAST evening, after three weeks of dry weather, there was a heavy downpour of rain which sent people hurrying in all directions for shelter. How good it was to hear it beating upon the roof and windows, rushing down the gutterings, and overflowing on to the sunbaked gardens. In a little while the grey clouds had gone, leaving the sky a clear blue patterned with silver shapes; the sun broke through and sent beams of light across the wet roads; in the trees birds perched on dripping branches and whistled their songs of thanksgiving in the stillness of the evening.—**—"Alison Grey," Tauranga.**

FORGET-ME-NOTS

FORGET-ME-NOTS poured down the hillside in torrents, they filled the valley with lakes. They were heaven come to earth, of the deepest, most heavenly blue ever seen in the sky or reflected in the ocean. They were a revelation of sheer loveliness in their abundance, riots and rivulets. In their singleness, each bloom was large and strong. As I held one in my hand and tried to find an earthly colour with which to compare it, I could only think of a sister flower—the gentian. . . . The name of forget-me-not . . . is translated by Coleridge as "Hope's gentle gem" and by Clare as "Friendship's gentle plea."—**Dr. Neville Bradley** describing forget-me-nots flowering in a Yunnan valley.

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I WOKE early this morning and peeped out of the window—there was a glimpse of sea, a green hilltop, a silver birch against the sky, and all the gay colour of our garden—pink and oriental poppies and lupins, and daisies, and a lavender-coloured clematis. And because I could not go to sleep again I made the morning scene into these wee verses—

I woke this morning soon after dawn.
A blackbird was skimming across the lawn,
His wings as black as the vanished night,
His beak as gold as the new-coined light.
Blue lupins and pink pycnanthemum daisies
Were dancing and bowing their flowery praises
For a day so shining and silver and blue—
But not a sparkle or glint of dew,
For a little rollicking wind was about,
Blowing the poppies inside out,
Tearing the petals from a yellow rose,
And making the grasses touch their toes!

—"Tinkle Tinkle," Dunedin.

◆

Transformation Scene

I CAME to my new home a few months ago when Nature's glories lay dormant. It was easy to see that no garden lover had been within those gates for years. No flower beds were visible. There was only an untidy growth of weeds merging into some sort of a lawn, and a drive that was quite overgrown. A row of unkempt rose bushes and some straggly shrubs completed the depressing picture.

Clearing the place meant work—creative work. Soon I had pruned the shrubs, hoed the paths, and cleaned up the drive. What a relief it was to have made a start at least. To distinguish between lawns and garden I had to spend hours pulling up long roots of couch grass and sorrel, but I was rewarded by the sight of carnations and bulbs peeping through here and there. Spring came and revealed long-hidden daffodils, snowdrops, and jonquils. Freesias and ixias sprang up from nowhere and bloomed radiantly in their new-found freedom. Every day I watched the leaves unfolding on the shrubs, and soon a flowering currant blushed shyly into bloom, followed by a deep mauve lilac, a sweet-scented mock orange, and a beautiful snowball tree. By this time I was quite beside myself with the joy of the transformation, which was due in part to my efforts. But the best was yet to be—the roses came to life. You should see them in the early mornings—pink, white, and creamy yellow, dew-pearled and lovely beyond description. **—"Native Flower", Waipukurau.**

GARDEN PLANS

THE garden was a wilderness: I didn't know where to make a start. I have far too much lawn to cut, and my lawnmower would break anyone's heart. Looking at it wasn't doing any good, so I started work with a sharp grubber and kept at it from 9 a.m. till 2 p.m. day in and day out. Now I am rewarded for my labour. We decided to cut down the lawn, so we took to the bush and spent several days dragging home enough black pungas to continue the short length of rustic fence on the orchard side of the house. It has greatly improved the appearance of the grounds and a new bed running the full length, 36ft., has been prepared for roses to be planted in June. I also have a border over 70ft. long by the front hedge and these two new beds frame the lawn. The lawn was marked out for a tennis court, but with a war on our hands we were not able to put our plans into action nor proceed with the swimming pool.

I have always lost myself in the garden work when other things try and get me down—it does one good to have an outlet from the eternal routine of dishes, bed-making, etc. The roses have been a picture this season. We are altering the drive near the garage and the roses there have to be removed, hence the new bed at the other end of the grounds. There are so many plans waiting to be carried out, but we had to put our farm into shape and clear land and get it into grass first before we could feel free to turn our attention to other matters.

Now that I have the worst of the gardening done I must repaint the handles of my tools. Often when in the garden I have to drop my fork to rush in and answer the 'phone, and the handle being grubby with soil it is often hard to find should I get sidetracked for awhile. Tool-handles enamelled bright red are the best solution.—**"E.G.", Auckland.**

Thank Heaven

Thank Heaven,
In this sordid place
I can sometimes
Turn away my face,
And think again of other days
Heaven spent.
Think of rivers flowing
Cool as snow,
Of lakes lying
Still as glass,
With autumn hillsides
Mirrored there;
Of daisies growing
In luscious meadow grass
On little islands,
Very green and very fair.

Jams and Jellies

THE jam-making season is a particularly busy one for the housewife, with fruit to be picked over and prepared, sugar to be weighed, and the necessity for spending extra time in the kitchen to watch over the bubbling contents of the preserving pan. But later, when you survey all those neat rows of jars with their gleaming red and amber contents, you experience the deep satisfaction which follows the completion of a worthwhile task:—

> "I have known
> Happiness blaze for hours
> With no more fuel
> Than apple jelly
> Standing on a sill
> Glowing and shining
> Like a country jewel."

If you are finding it difficult at present to save up enough sugar to make jam, try using other forms of sweetening for your ordinary cookery requirements—golden syrup and sultanas in plain cakes and biscuits; condensed milk in puddings, sauces, and salad dressing. Beetroot, cooked and grated, will sweeten stewed fruit (even such acid fruit as rhubarb). Allow from ½ to ¾ cup of beetroot to 1lb. of fruit, adding it a few minutes before the fruit is due to come off the fire, and simmering gently till the fruit is cooked. By following these hints you will be able to use the greater part of your sugar ration for your preserves.

Always choose firm, sound fruit—never make jam of fruit which is over-ripe, as it will not jell properly. It is a good idea to rub the bottom of the pan with butter before putting the fruit in, as this prevents burning. The jam should be stirred frequently before it comes the boil, a wooden spoon being most suitable for the purpose. (Never stir jelly after boiling point has been reached). Jam should be boiled fast and to avoid skimming it add a small piece of butter when it is boiling (1oz. of butter to every 3lb. of jam).

To Test Jam or Jelly:—Place a little on a cold plate. When cool a skin should form on top. It is then ready for bottling.

Make sure your jars are perfectly dry, and warm them slightly before filling them. Cover them at once, or else leave them till they are quite cold before sealing them.

QUINCE CONSERVE.

6 quinces, 4lb. sugar, water.

Wipe the quinces and cover with water and boil till tender. Remove the quinces from the liquid, and peel and slice them finely after they have cooled. Make a syrup of the sugar and liquid (there should be 2 pints of the liquid, but a little water can be added, if necessary, to make up this amount) and boil for 20 minutes. Then add the sliced quinces and cook another 50-60 minutes, and test.

APRICOT JAM.

6lb. apricots, 5lb. sugar, 1 cup water.

Wipe and cut up the apricots, removing the stones. Crack some of the stones and take out the kernels. Add these to the fruit and water, and cook for 10 minutes before adding the sugar. Stir until the sugar is dissolved and then boil 20 to 30 minutes. Test.

RHUBARB JAM.

4lb. rhubarb, 4lb. sugar, 1 lemon, 3 teaspoons ground ginger or ½lb. preserved ginger.

Wipe and cut up the fruit. Put it in the pan and add the sugar, also the juice of the lemon and the rind thinly sliced. Allow to stand all night. Drain off the syrup and bring it to boiling point. Now pour it over the rhubarb in the pan, add the ground ginger or the cut-up preserved ginger, and boil 20 to 30 minutes, or until a skin forms on testing.

MARMALADE.

3 large grapefruit, 2 lemons, 12 cups water, 6lb. sugar.

Put the fruit, pips and all, through a mincer, using a fine blade. Boil with the water for 20 minutes before adding the sugar, and then boil again

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for **exactly** 45 minutes. Test, bottle, and cover while hot.

—**(Sent in by "Lady Jane.")**.

RASPBERRY AND PLUM JAM.

5lb. Satsuma plums, 3 cups water, 2½lb. raspberries, 7lb. sugar.

Wipe the plums and boil them in the water till they are soft. Strain them through a colander to remove the skins and stones. Now add the raspberries and sugar, and cook 40-45 minutes. Test before bottling. This jam has the most delicious raspberry flavour, and the Satsuma plums not only help it to jell, but colour it an attractive red.

MELON JAM.

Melon, sugar, lemons, preserved ginger or ground ginger (optional).

Peel the melon and remove the seeds. Cut into small squares and to every pound of fruit allow ¾lb. sugar, ½ lemon (rind and juice), and 1½oz. preserved ginger or ½ teaspoon ground ginger. Place the fruit in the preserving pan, cover with the sugar, and leave to stand for 12 hours. Boil for 1½ hours; test.

STRAWBERRY JAM.

3lb. strawberries, ¾lb. gooseberries, 3lb. sugar.

Place the strawberries in the preserving pan, cover them with sugar, and leave them to stand overnight. Take a small quantity of the juice which has collected and cook the gooseberries in it till they are soft. Then strain them through a colander in order to remove the skins and add the remaining pulp to the strawberries. Boil all together quickly for 20 to 30 minutes, then test before removing from the fire. The juice of a lemon makes a pleasing addition to the jam's flavour. If this is used, add it before putting the strawberries on to cook.

BLACKBERRY JELLY.

4lb. blackberries, 1½lb. apples, sugar, water.

Slice the unpeeled apples and cover with water and cook till they are soft. Add the blackberries and continue cooking. When ready, strain through a muslin bag. Add sugar in equal proportions to the amount of juice (measure by cup), and then bring to the boil and cook till a skin forms on testing.

CRAB APPLE JELLY.

Crab apples, water, sugar, cloves (optional).

Wipe the apples and slice them. Do not peel them or remove the cores. Cover with water and boil them till they are soft and mashy. Pour into a jelly bag and leave to strain through the bag. (Squeezing makes the juice cloudy). Measure the juice carefully and to each cup of juice add 1 cup of sugar and 1 or 2 cloves (lemon juice or clove essence may be used if desired, or the flavouring may be omitted altogether). Boil until a skin forms on testing.

Table of Contents—February, 1946.

Food and Agriculture Organisation of United Nations . 113
Millet—P. S. Syme 117
Book Review 121
Haymaking Equipment—T. E. Rodda 123
Radio Broadcasts 128, 153
Removal of Surplus Honey—E. Smellie 131
Grass-grub and Porina—E. M. Bates 133
Harvesting Chou Moellier Seed Crop—G. K. McPherson 134
Ngaio Poisoning of Cattle—P. J. McCann 139
Spraying Late-harvested Apples and Pears—A. R. Grainger 141
Studies in Farm Management: A Waipara Pastoral Farm—E. G. Smith 143
Hop Culture in Nelson District—N. J. Adamson . . 147
Lambing Estimates for 1945 155
Chilled Beef: Production of Cattle in Waikato and Waipa—T. E. Rodda 157
Show Standards in Poultry Breeding are Essential—L. Cocker 163
Rotation of Crops—E. M. Bates 167
A 7-ton Roller for Light and Medium Land of Canterbury—G. K. McPherson 169
Scale Insects That Affect Citrus Trees—P. Everett . . 173
Cover Crops for Citrus Soils 174
Subsurface Broadcasting: New Type Coulter Trials on Linen Flax—A. G. Elliott and A. O. Gidall . . 175
Winning Baconers Satisfy British Trade 177
Topworking Undesirable Varieties of Citrus—P. Everett 183
Pasture Topdressing: Experiments in Northern King Country—K. M. Montgomery 185
Inexperienced Orchard Staffs Need Adequate Instruction—A. R. Grainger 190
In the Home Garden—D. K. Pritchard 191
Preservative Treatment of Fencing Posts—State Forest Service 193
Young Farmers' Clubs—S. Freeman, Organising Secretary 197
"The Good Neighbour," by Mary 203
Making New Garments from Old Clothing—Eva Topping 207
What Drastic Rationing Really Means—Dorothy Johnson 215

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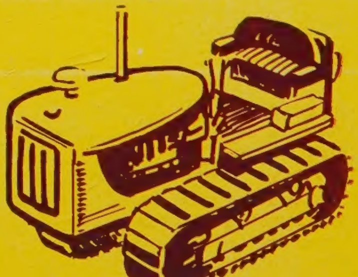

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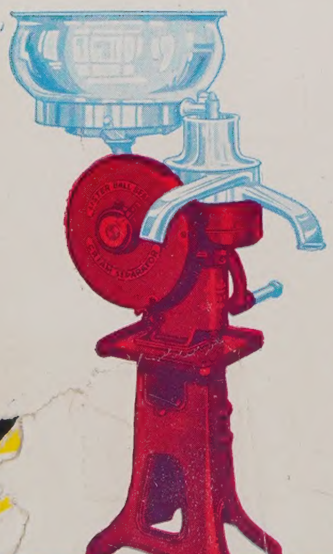

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